

INDIAN FOOD INDUSTRY



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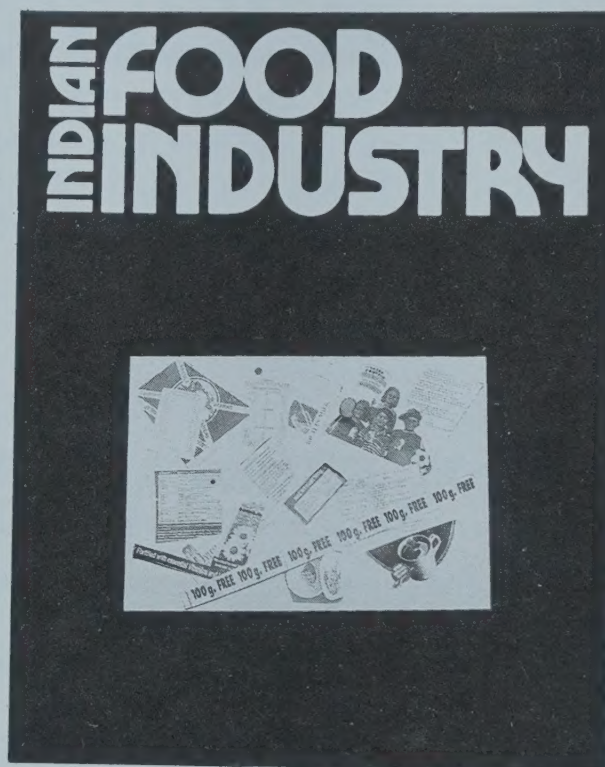
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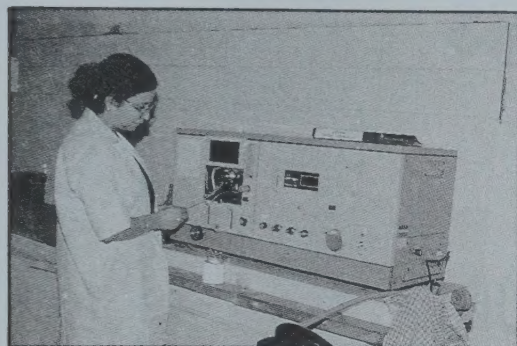
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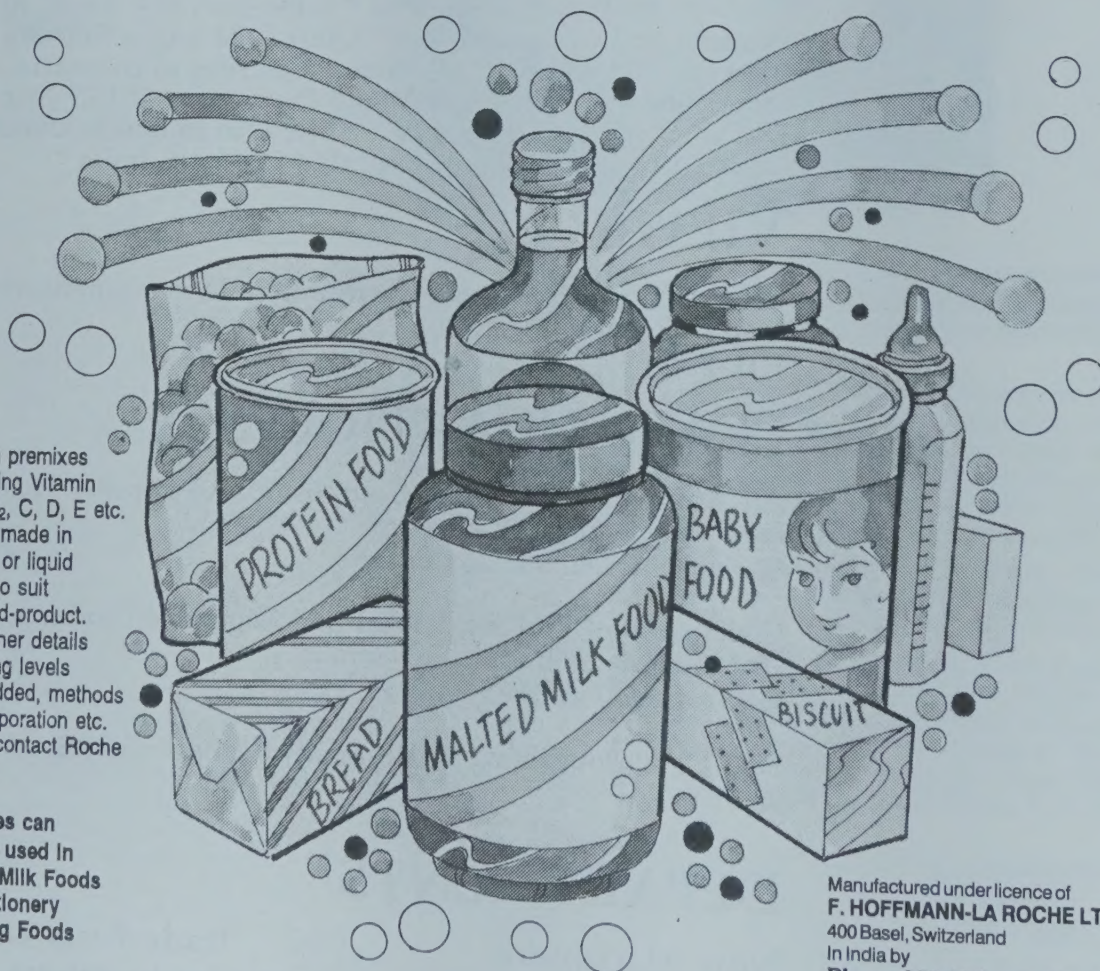
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FROM THE CHIEF EDITOR'S DESK

What sells ? This is a moot question, I am sure, confronting every entrepreneur. Is it the brand name ? If so, how to establish a selling brand name, if one is a beginner ? Some are so obsessed with the idea that they will go to any lengths, even to imitate the brand names of highly successful products by clever and connived change of the spelling of the word. Some think that alluring and enticing advertisements and even those with a hidden threat will sell. Another gimmick is to pretend to be scientific for health promotion, mental prowess improvement etc. A few, I guess, only a very few, have considered quality.

What are the profiles of quality ? Basically, it is conformation to prescribed standards and being devoid of adulterants or harmful factors, all of which are closely linked with good manufacturing practice. Consideration of quality is peremptory more now than ever before owing to the Government's policy of liberalization and global competition. Importing countries have begun to impose stringent quality standards more in the area of safety aspects. We are aware of rejections in recent years, of spice mixes, tea and marine products because of harmful contaminants.

In this issue of IFI, Sohrab (P. 37) discusses the manufacturing practice vis-a-vis quality of the finished goods, which provide us with useful guidelines and directives. Nutritional labelling, which is mandatory elsewhere, can be a good sales promotional factor, ought to be non-fictional. Subbulakshmi and Chitra (P. 21) have uncovered some fictions in the nutritional labelling of some Indian brands of beverages. Their important quotes from Foster (1990) are to be remembered and adhered to. All those who are aware of the changed scenario in the food-world both nationally and internationally would know that **quality alone will sell.**

Richard Joseph
Chief Editor

INDUSTRY NEWS

Bright Future for Indian Processed Food Industry - A Report

By the year 2005, the country will house at least 10 players in the processed food business having a sales turnover of Rs. 3,000 crores or more each, according to a McKinsey and Company Inc official.

Mr. Anupam Puri, a senior official of McKinsey, who was engaged in the study of the country's food industry conducted in association with the Confederation of Indian Industry (CII), also said that businesses in soft drinks, dairy products and confectionery held potential in the country, along with packaged wheat flour, milk and bakery.

The CII-McKinsey report titled "Food and Agriculture Integrated Development Action (FAIDA) : Modernizing the Indian Food Chain", was released recently in New Delhi in the presence of Mr. Jaipal Reddy, the Union Minister of Information and Broadcasting.

Mr. Puri said that the food industry would be the driving force behind the country's economy in the near future, benefitting both consumers and the domestic players. According to him, in terms of share in the country's GDP, food held a major chunk of 26 per cent. In terms of employment, the food industry employed 61 per cent of the total employed.

There was a huge potential in certain food sectors such as

processed meat and poultry, soft drinks, packaged *atta* (wheat flour), packaged milk, dairy products, confectionery, tea, coffee and bakery, he added. The report said that the packaged *atta* industry would grow to a Rs. 15,000-crore industry by year 2005, whereas soft drink would grow to Rs. 10,500 crores, packaged milk to Rs. 36,000 crores, bakery to Rs. 10,000 crores by year 2005.

Mr. Puri said that the local players would rule the basic food market in the future, despite the invasion of multinational companies. He quoted figures from other countries in support of his argument. In the liquid milk market, in New Zealand and the Netherlands, local players have a share of 100 per cent, while in Australia, it was 90 per cent.

Similarly, in the flour market, local players in Malaysia have 100 per cent market share, while in Thailand, local players own a 95 per cent market and in Philippines 90 per cent.

The CII President, Mr. N. Kumar, requested the Union Government to take positive steps to boost the food processing industry. A former president of the chamber also asked if it was feasible for such growth in the food market in the era of excessive taxation on refrigeration infrastructure.

He raised doubts if local players will own a major share of the market, to which Mr. Puri said the basic food market was always domestically driven.

Other officials of CII added that recent trends indicated that the growth of demand for packaged food industry in rural areas was higher than that of the urban.

CSIR's Initiatives to be More Industry- Friendly

Having doubled its earnings from the private industry to Rs. 64 crores during 1996-97, the Council of Scientific and Industrial Research (CSIR) has launched two initiatives aimed at ensuring continuity to take care of customer demands and an effort to rejuvenate its 'ageing' scientific manpower.

The CSIR achieved a new high of grossing Rs 203 crores from external sources, of which Rs 64 crores came from the industry. During the previous year (1995-96), the apex scientific and industrial research body earned Rs. 167 crores of which Rs. 32 crores came from the industry.

According to the CSIR Director-General, Dr. R.A. Mashelkar, the earnings of CSIR were going up despite 1996-97 being a bad year for Indian industry. This clearly was a very encouraging sign for the Council, as it demonstrated the confidence of the domestic industry in our technologies.

In order to derive more benefit from this favourable phase, the CSIR has decided to set up an independent customer satisfaction cell at Pune. The idea was to get a feedback about the technologies transferred and give the very best to the industry.

The customer satisfaction cell would be led by Dr. S. Banerjee, a former research and development chief of the public sector steel

authority of India Ltd. The cell would network with all the 40 CSIR laboratories and use private consultants to evaluate and get the feedback about CSIR technologies.

The second initiative is directed at rejuvenating the 'ageing' scientific manpower (average age being around 48 years) and infrastructure. The inputs would come from an expert committee chaired by Dr. T. Prahalad, Director of the National Aerospace Laboratory (NAL), Bangalore.

The committee with representatives from the Indian Institute of Management (IIM) is expected to submit its report very soon.

It is expected to provide a strategy for the CSIR to optimise efficiency of its manpower, recast the administrative, store and purchase infrastructure as well as give suggestions on assessment and promotion policies of personnel. Dr. Mashelkar said that to improve the overall output of individual laboratories, a 'Performance-linked Budgeting' policy is being implemented. Under the exercise, the CSIR has drawn up a series of criteria to evaluate the performance of each laboratory. According to the assessment, the laboratory would be graded and budget approved.

Another significant development for CSIR has been the freedom to selectively recruit young scientists from abroad to any of its laboratories on attractive terms. For more than a decade, it was difficult to implement the scheme. Now "we plan to really get some good scientists to work in India." Dr. Mashelkar said.

To provide a conducive environment for young researchers in the laboratories, the CSIR has thrown open its facilities and is taking in more students under various projects as well as helping them out in the placement also.

Coffee Cultivation in North-East India to be Expanded

The Coffee Board, a wing of the Union Commerce Ministry, has submitted a comprehensive project to the Planning Commission for taking up cultivation of coffee in the north east during the Ninth Plan.

Coffee Board chairman Philipose Mathai, told that about 40,000 hectares had been identified in the north-east for coffee cultivation in 1976 but it had been taken up in only 10,000 hectares.

"Even in these areas, there is a wide productivity gap owing to lack of inputs, skilled labour, manpower, financial support and infrastructure," he said.

To overcome these drawbacks and to expand cultivation in the rest of the areas, the Coffee Board had drawn up a scheme for the Ninth Plan and it was being scrutinized by the Planning Commission. The Coffee Board had found the north-east region 'extremely good' for coffee cultivation, and if the cultivation was carried out properly, the quality could be as good as the being produced in Columbia, he said.

To a question, if India could achieve the coffee production target of three lakh tonnes for the Ninth Plan, he replied that could be done, provided an 'aggressive' thrust was given in the north-east.

Mr Mathai said that during the Eighth Plan, India was likely to fall short of the production target by 4 per cent.

Since coffee production tends to decline every alternate year, sometimes the production exceeds target and generally declines the following year.

The Coffee Board, which had been providing coffee for the domestic consumers at a minimum cost until the free sale quota was allowed to the growers in 1993, had totally withdrawn from marketing.

However, it was allowing minor set-ups of coffee auctions and private parties to auction coffee in its premises.

Coffee Board Forecasts Record Crop for 1997-98

At a time when world coffee futures prices have already spurted to the highest point in almost two decades, the further good news for India's growers is that their crop in the coming season of 1997-98 is well on track to be their highest ever at 2,41,000 tonnes.

The Coffee Board's pre-blossom estimates had indicated a record crop of 2,33,000 tonnes (previous highest 2,23,000 tonnes for the 1995-96 season).

Coffee Board chairman Philipose Mathai told that the blossom shows had been good throughout the coffee growing belt.

The Coffee Board's post-blossom survey indicates that, out of the 2,41,000 tonnes, Arabica will account for 1,04,200 tonnes and Robusta for 1,36,800 tonnes. (The pre-blossom estimates for the coming 1997-98 crop had indicated that, out of a crop of 2,33,000 tonnes, Arabica would account for 1,04,200 tonnes and Robusta for 1,29,000 tonnes).

Out of the record 2,23,000 tonnes for the 1995-96 crop, Arabica had accounted for 1,03,250 tonnes and Robusta for 1,19,750 tonnes.

Out of the 2,05,000 tonnes for the subsequent crop of 1996-97, Arabica accounted for 90,450 tonnes and Robusta for 1,14,550 tonnes.

Harvesting of each year's crop begins in October-November for Arabica and ends in March-April for Robusta.

The Coffee Board's survey indicates that Karnataka could account for almost 70 per cent of the coming crop with 1,68,000 tonnes (86,200 Arabica and 81,800 Robusta).

Kerala is projected to account for almost 20 per cent with 48,000 tonnes (3,000 Arabica, 45,000 Robusta).

The balance is made up by Tamil Nadu (23,000 tonnes, inclusive of 13,000 Arabica and 10,000 Robusta), and the North-Eastern region and non-traditional areas (2,000 tonnes Arabica).

Kodagu is projected to be the main contributor to Karnataka's 1,68,000 tonnes with 81,000 tonnes (27,000 Arabica and 54,000 Robusta), followed by Chickmagalur with 63,000 tonnes (40,000 Arabica and 23,000 Robusta) and Hassan with 24,000 tonnes (19,200 Arabica and 4,800 Robusta).

Spice Exports up by 11%

Spice exports from the country fetched Rs. 111 crores in April this year, an increase of 11 per cent compared to the same period last year. In April 1996, the worth of spice exports was Rs. 99.44 crores.

However, there was a slight fall in the quantity of exports during the same period. As against 25.606 tonnes in April 1996, the country could export only 20,000 tonnes during the first month of the current financial year.

The fall was mainly due to the decline in the export of chillies. As against the export of 10,632 tonnes of chillies in April last year, it was only 3,000 tonnes in April 1997. All other export commodities have shown increase in the first month. The country exported 6,350 tonnes of pepper during April, creating a record in terms of percentage of increase over the last year. During last April, only 1,950 tonnes of pepper was exported as against 1,770 tonnes of pepper exported in April 1995.

The continuing surge in export of black pepper from India reflects a tight supply position. With pepper from other parts of the globe still not coming into the international market, Indian pepper dominated. Leading packers and grinders had exhibited some anxiety during April in cornering the meagre supply.

Although the new crop from Sarawak had started arriving, the quantity had been limited, sources in the Indian Pepper and Spices Trade Association (IPSTA) said. Even supplies from Vietnam have not made a dent in the interest in Indian black pepper.

In tandem with the great demand for Indian pepper, the prices at the Kochi market have maintained a firm trend. The price of the garbled variety in the cash market was Rs 10,300 per quintal on April 26. Thereafter, the price came down with the cash market price on April 30 hovering around Rs. 12,150 and Rs. 11,900 per quintal. The future prices saw some volatility.

Substantial and steady increase in pepper output from Indian farms is fundamental for the continued good performance of exports. The domestic market too was growing rapidly. Any small increase in production will be absorbed solely by the domestic market.

Non-Intensive cropping, senile vines and uneconomic prac-

tices are some of the reasons for the poor rates of pepper production in India.

AVT-McCormic's Impressive Export Turnover

Sourcing of processed, finished products has come of age in the spice sector with the Kochi-based AVT-McCormick Ingredients Ltd, the 50-55 joint venture of AVT group of companies and McCormick of US, achieving an export turnover of Rs 30 crores in 1996-97, in the first year of operation.

The company has projected a turnover of Rs 55 crores in 1997-98, almost double that of the previous year.

AVT-McCormick unit started commercial production on May 1, 1996. The Rs 30 crore project has a capacity to produce 18,000 tonnes of processed spices. McCormick's entry into the Kerala market in 1994-95 was considered as a major development in the spice sector.

On the other hand, it also meant a reduced role for middlemen in spice trade. For the Indian partner, the strategic alliance benefitted in terms of quality and value addition. The value addition by processing is reportedly at 40 per cent.

According to Mr M. S. A. Kumar, Managing Director, AVT-McCormick, the company has started exporting to most of the countries in Western Europe and Poland in the east and is making good progress in US. The challenge is to meet the food safety and quality requirements of the western market.

With its major presence in world spice and flavourings market, sourcing depended on superior quality.

The Spice Mill at the company's unit near Kochi has the capability to clean, pasteurize, grind and blend a wide range of spices.

The 100 per EOU is at present processing mainly black pepper and chillies but will soon take up turmeric, ginger and celery. The company with its cost competitiveness would soon be a major sourcing centre for McCormick.

Spices Board for Cut in Cess on Exports

The Spices Board has urged the Centre to reduce the cess on spices export to 0.5 per cent and exempt value-added spices products from any such levy.

According to official sources, the rationalization of the cess on exports is necessary to give a competitive edge to Indian spices products in the international market.

The government currently levies a 2 per cent cess on exports, while another 0.5 per cent is collected as agricultural produce cess. The cess negates the competitive edge for Indian spices exporters as even a 1 per cent difference in prices could give a crucial edge to competing countries.

The Spices Board has also taken up with the Centre the issue of inadequate supply of the required varieties and quality of spices in the country as well as the non-availability of certain spice products like paprika chilli.

Sources say that the Spices Board has plans of inviting experts from abroad to explain the recent development in the spices sector in their home countries.

In turn, leading spice exporters may visit the major

markets to strengthen relations and conclude on-the-spot business.

Good scope for Indian spice exports is seen in Latin America, North Africa and certain parts of Asia.

In particular, good potential is seen for expanding pepper cultivation, as India is now in a position to supply steam-sterilized pepper.

The developed countries preferred steam-sterilized pepper, and so far, two companies have gone on stream to steam-sterilize about 30 tonnes of pepper annually.

Centre to Hike Outlay for Spices Scheme

The centre has plans to increase the outlay for the centrally-sponsored integrated programme for spices development during the Ninth Plan besides widening its area of operation according to Union Minister of State for Commerce, Dr B. B. Ramaiah in a statement.

The programme would be a continuation of the integrated programme for spices development introduced during the Eighth Plan with a total outlay of Rs 125 crores.

The programme would cover various proposals to increase spices production, distribution of planting material and measures to protect plants.

It is an accepted strategy of the government to add value to spices export and as a means to achieve this, exports of spices in consumer packs was being encouraged.

The logo scheme of the Spices Board was operated to benefit exporters. The board also has plans for developing product design, graphics and bar coding.

The government also plans to meet the additional costs of special packaging as an incentive.

Asked about the challenge likely to be posed by Vietnam in spice exports is the global market, Dr Ramaiah ruled out any threat owing to the high quality of Indian products.

He said that during the last five year, the thrust had been on investing heavily, which was still continuing. Besides, efforts were on to upgrade technology and get value-addition.

The minister said that India was of the view that Vietnam would take sometime to gear itself up and would have to invest heavily to enable its spices and spice products to compete with India in international markets.

Tetra Laval's New Venture

The \$12 billion Tetra Laval group, world leaders in food processing and packaging, have set up a new Rs 60 crore plant at Talegaon, near Pune. Speaking at the plant's inauguration, chairman Goran Grosskopf said that India was not only the largest milk producer in the world, it was also the largest producer of fruits and the second-largest producer of vegetables. Yet, as a result of inadequate processing and packaging facilities, about 30 per cent of the produce was lost due to wastage. Also, milk consumption in India is way below the world average. Milk needs to be packed properly to reach remote areas unspoiled and safely. The new Tetra Pak factory is a link in this chain and will produce aseptic packaging material which will keep milk and processed liquid foods fresh for as much as six months, without refrigeration.

Recovery and Recycling of Poultry Processing Wastes

Recovering and recycling waste products into feeds is a continuously evolving process. Evaporations system allows the recovery of secondary proteins from liquid products with high moisture contents, such as DAF discharges, blood and stickwaters, using its Forced Flash Evaporator.

Waste water from poultry processing plants contains vast amounts of organic materials that can be removed by the dissolved air floatation (DAF) process, to make it suitable as ingredients of poultry diets. DAF by-products were removed from waste water at two broiler processing plants using different water treatment processes and two feeding trials assessed the potential of including these in broiler diets. The qualities of fats in all DAF by-products fed in these trials were poor, but growth data through 42-days of age indicated that they could be included in diets up to 2% of the diet without reducing performance.

Export of Eggs to the Gulf Touches 1.5 Million Mark

India's National Egg Co-ordination Committee (NECC) has made arrangements for the export of 1.5 million eggs per day to the Gulf countries during the first three months of this year to domestic market. Mr. K. Lakshminarayana, Chairman of the Vijayawada zone of the NECC said that the crisis in the poultry

market had come about due to steep feed prices and the stagnation of egg prices. Egg consumption was also not increasing, especially in Andhra Pradesh, which was the leading state in the poultry sector.

He added that following the liberalization of the economy, the curbs on the export of agri-commodities had been lifted and as a result, maize, soya cake, niger cake and groundnut powder were being exported on a large scale and as a consequence, the prices of these feed ingredients had increased dramatically.

Last year, 0.1 million tonnes of maize was exported and so far this year it has doubled. As a result, the cost of poultry feed has risen by 33%, whereas the egg price has only risen by 14% and many small farmers have had no option other than to close down farms. To control the situation, the NECC sought to encourage egg export to the Gulf and European countries.

Decline in Shrimp Production

The output from the country's shrimp farms during 1996-97 remained at the same level as the previous year even as the outlook for the sector is bleak.

After reaching a level of 82,850 tonnes during 1994-95, the production had declined to 70,573 tonnes the succeeding year and remained almost at the same level during 1996-97 at 70,686 tonnes. The area under shrimp farming in the country increased marginally from 1.19 lakh hectares to nearly 1.36 lakh hectares.

If the outbreak of viral disease in the shrimp farms had led to a decline in production during 1995-96, it was the problems faced by the sector on the legal front

with curbs on setting up new farms that had kept the production pegged and the same level during 1996-97 also, according to sources in the Marine Products Export Development Authority (MPEDA).

Andhra Pradesh continued to be the top producer among the States. While the production area in the state increased from 50,000 hectares to 60,249 hectares, the output rose by 12.66 per cent, from 27,140 tonnes to about 30,577 tonnes during 1996-97. In this context, it has been pointed out that not all the available area had been utilized for farming during 1995-96 because of the outbreak of the viral disease in the farms.

Among the bigger States, the highest production increase in percentage terms was recorded by Orissa - about 13.5 per cent, though in physical terms the increase was only about 805 tonnes (from 6,000 in 1995-96 to 6,805 tonnes in 1996-97).

The area under farming declined steeply in Tamil Nadu from 2,879 hectares to 640 hectares though there was a marginal increase of 3.39 per cent in production, which touched 1,129 tonnes during the year.

Another trend that surfaced during the year was the continued decline in production in the traditional shrimp farming States, including Kerala and West Bengal. While the area under farming increased from 34,660 hectares to 42,605 hectares between 1995-96 and 1996-97 in West Bengal, the production declined from 23,445 hectares to 19,949 tonnes.

In the case of Kerala, the area under farming remained the same- 14,658 hectares-while the production declined from 9,000 to 8,225 tonnes. During 1995-96 also, there had been a drop in production in the two States on account of the outbreak of disease about 1,500 tonnes in West Bengal and 3,000 tonnes in Kerala.

In Karnataka, the area under cultivation remained static at 3,500 hectares, while the production rose by about 12 per cent to 2,300 tonnes.

Among the States, where shrimp farming is limited, production increased marginally in Goa (580 tonnes) and in Gujarat (571 tonnes), while it declined to 523 tonnes in Maharashtra compared to 740 tonnes during the previous year.

During 1995-96, it was the observance of the crop holiday following the outbreak of viral disease in the farms that led to a drop in production in the main growing areas. It was estimated that the disease and its recurrence had led to a production loss of nearly 20,000 tonnes in Andhra Pradesh and Tamil Nadu during 1995-96.

At the global level also, there was a decline in the production of farmed shrimp during 1996, with Asia accounting for the maximum decrease.

Epidemic Causes Black Tiger Shrimp Prices to Go up

The price of black tiger shrimps (*Penaeus monodon*), one of the top foreign exchange earners of India, has shot up by Rs 60 a kilo since the outbreak of an epidemic in shrimp farms around Calcutta. The price of the 16/20 grade black tiger shrimp, which quoted at Rs 480 per kg in the local market, has gone up to Rs 540 due to an acute short supply.

To review the situation and formulate a plan of action, Marine Products Exporters Association (MPEA) of eastern India has called an emergency meeting of its members. Shrimp export is Rs 400 crore-plus industry in eastern India and employs thousands of both casual

and permanent workers. Nationally, shrimp exports bring in around Rs 4,000 crores.

According to marine biologists, the cause of the disease may not be viral or bacterial attack. This was a typical symptom of over cultivation and a resultant oxygen depletion in the farms. According to Mr Samarjit Balial, a marine biologist with Japanese importer Marubeni.

He said that, "This was a preliminary attack and unless something was immediately done to check it, other secondary attacks like viral or bacterial epidemics could break out, as it did almost every year.

As a step to check the spread of the disease, Mr Balial said that the farms should immediately raise the water level and reduce the load on the tanks by selling off excess shrimp which was causing the oxygen depletion.

Failure to Pass Aquaculture Bill Puts Shrimp Farms in Slumber

The recent political impasse in Delhi has hit aqua firms hard. The Aquaculture Bill, aimed at providing relief to the aquafirms, could not be proposed due to the sudden political uncertainty, thereby leaving the fate of the hundreds of shrimp firms dangling. Scientific aquaculture, had been banned by the Supreme Court following a public interest litigation filed by some environmental activists. The Supreme Court had asked all aquafirms within 500 metres of any waterbody to stop operations by March 31. The aquafirms later managed to get a stay order from the apex court till April 30.

International Market for Dairy Products Bright

Operation Flood, the world's largest integrated dairy development programme started in 1970 by the National Dairy Development Board (NDDB), has given the Indian dairy sector a new-found vigour and respectability.

In rural and semi-urban areas, animal husbandry generates jobs, especially in less developed areas like hilly and drought-prone districts. In fact, during the 1980s, employment potential in the livestock sector grew faster than in the agriculture sector as a whole. That was also the period when India's dairy farming expanded, especially in States which boasted high stocks of milk, like Punjab, Haryana and Rajasthan.

As a result, India's milk production touched 66 million tonnes in 1995-96, having grown annually at the rate of 4.5 per cent since 1990-91. India is now the world's second largest producer of milk. But India's share in the world dairy trade is not very significant. The export earnings from the livestock sector rose from Rs 792 crores in 1988-89 to Rs 1,672 crores in 1994-95.

Worldwide, according to the recently released second annual report on the world market for dairy products prepared by the World Trade Organization (WTO) the prospects exist for an increase in milk production. This boom will be fuelled by further expansion in developing countries and Oceania (Australia and New Zealand). In the Commonwealth of Independent States (CIS) and Eastern Europe, however, milk production is likely to stabilize, with milk producers shrinking in number and average dairy herd size in-

creasing. In these countries, the dairy processing industry appears to be getting more and more concentrated, a situation that can only hold promise for developing countries, and India is especially well placed to capitalize on this opportunity.

The world trade in both skimmed and whole milk powders has risen overall, although production of skimmed milk powder declined in 1995. Exports of butter and butter oil picked up in 1995 due to growing demand from the Russian Federation and the Near and Far East countries.

Cheese was the bright spot in the world dairy trade. Not only did production rise, but prices for cheese remained firm during 1995. The WTO thinks that the fact that cheese is being produced more rapidly than milk indicates a progressive shift worldwide towards the production of value-added products.

For India, the Technology Mission on dairy development will supplement the efforts of Operation Flood. It will coordinate dairy development with various field-level programmes. The Mission has set specific research goals and will focus on policy issues to sustain dairy development.

To do so, in this year's budget, the department of animal husbandry and dairying of the ministry of agriculture has set apart Rs 11 crores, of which Rs 2 crores is meant for Operation Flood III. The budget has also earmarked Rs 39 crores as Central Plan outlay for the department. The dairy development component of this head provides for the Integrated Dairy Development Project in areas not covered by Operation Flood, as well as in hilly and backward areas. All these developments should hopefully spell out a bright future ahead for the industry.

Amul's Strategy to Promote Its Brand Ice-creams

Gujarat Cooperative Milk Marketing Federation Limited (GCMFL), more known for its brand name "Amul," is all set to push Wall's to the wall. Wall's from Kwality ice-creams, now a part of the Hindustan Lever Limited (HLL) group, has emerged as a clear market leader in the country in recent times.

Mr B. M. Vyas, MD, GCMFL told that by the end of 1998, most of the States in the country will be covered by ice-creams under the different cooperative brands.

The federation is hopeful of generating nearly Rs 500 crores out of its ice-cream business, at the end of next year. During the first year of its operation, the turnover from the ice-cream business alone was nearly Rs 65 crores. The federation has targeted Rs 1,000 crore turnover from its ice-cream business within the next three to four years.

The strategy adopted by the federation is very simple. Wherever there is no ice-cream brand promoted by any local milk cooperative unit belonging to National Federation of Cooperative Milk Marketing Unions, Amul ice-cream will be introduced, to counter Wall's and other private sector brands.

The federation, which launched its Amul brand of ice-cream on March 26, 1996, has already conquered Gujarat State within the first year of operation. It is now heading towards the southern and central parts of the country. Amul ice-cream has already bagged over 50 per cent of the market share in the major cities of Gujarat. This year, Amul ice-cream has been launched in three

states. Launched in Mumbai on January 26, 1997, it has already covered approximately 30 per cent of the ice-cream market of the city. Amul was launched in Bangalore on April 16, 1997 and in UP on May 5, 1997. Amul ice-cream will enter four more States shortly and one more in July. By the end of next year, most of the States will be covered by ice-cream under cooperative brand names.

Kikkoman Soy Sauce in Fray to Satisfy Western and Chinese Tastes

As Japanese consumers munch on more hamburgers and choose French fries over fried noodles, the world's leading soy sauce maker is looking to the West as the future for oriental flavourings.

With limited scope to boost sales in the saturated home market, Kikkoman Corporation says that it is looking to the United States and Europe for the profit opportunities, but is also eyeing China as a potentially promising soy sauce market closer to home.

Kikkoman already has a plant in Singapore and a factory in Taiwan to cater to the Asian market.

With a second plant in California due to commence operations next year and a new factory being built in the Netherlands to provide a European base, Kikkoman is aiming to expand its overseas presence by marketing Japan's most famous brand of soy sauce as a multipurpose, international seasoning.

While Japan's fondness for foreign food and cheaper varieties of standards soy sauce have capped domestic growth, more

and more Westerners are tucking into Asian food in restaurants and splashing soy sauce into their works at home.

The West is also seen as a growth market for soy-sauce spinoffs, like blended steak sauces and marinades and other new products, which Kikkoman hopes will put its profits back on a healthy rising curve after a couple of lean years.

Despite the Western focus, Kikkoman was on the lookout for opportunities in Asia and may take on Chinese makers on their home turf in the years to come, if the country looked like being a rich new revenue source.

Kikkoman is taking a caution approach to sell Japanese brand soy sauce in China mainland, which developed the art of soy sauce centuries ago. The price of the Chinese soy sauce is cheap. Since the income of Chinese is increasing year by year, it may be possible to market the Japanese product in a phased as a premium soy sauce for the discerning Chinese consumer. Chinese authorities have already been sounded of this more, though no detailed discussion has taken place as yet.

In the lucrative American market, its biggest rival is LaChoy.

In the year to end-December 1996, Kikkoman made a group net profit of 7.29 billion yens (\$62.8 millions), compared with 4.45 million yens (\$38.3 millions) a year earlier, on slightly increased sales of 206 billion yen (\$1.77 billions), although earnings fell at the operating level.

The company's latest forecast for 1997 is for a group net profit of 6.60 billion yens (\$56.8 million).

Coco Cola Urges Bottlers Not to Increase Maximum Retail Price

Faced with a demand slowdown in the overall carbonated soft drink market, the Coca Cola India (CCI) has urged its bottlers not to increase the maximum retail price of its beverages, despite the substantial increase in central excise and sales tax.

The company has even gone to the extent of saying that the burden of the rise in excise duty and sales tax would be shared by both CCI and the bottlers and would not be passed down to the consumers.

This was stated at a meeting of the company officials with the bottlers in New Delhi. The bottlers said that the CCI had asked them to absorb the hike and the company on its part would be putting in money to expand the market by increasing the volumes.

The softdrink companies are presently witnessing flat or negative sales *vis-a-vis* last year's volumes and this was a direct fallout of the current retail prices being charged to the consumer, officials at Moon Beverages, one of the bottlers for the company stated.

The government has to reconsider the excise hike, as the stagnant growth of the softdrink industry is resulting in decreasing excise revenues to the government, the bottlers said.

Due to the recent excise and sales tax hikes, the cost per crate of 300 ml bottles has risen by around Rs 7.

The Indian Soft drink Manufacturers Association is planning to take up the issue of high excise duties with the finance ministry.

It also proposes to draw the attention of the state governments to high sales taxes that are stifling the growth of the industry.

The duty on aerated waters has gone up from Rs 0.20 per bottle to Rs 1.28 per bottle and the maximum retail price has, on an average, during the last 14 years, gone up by 11.8 per cent per annum.

The bottlers stated that the government had reduced excise duties on most consumer items. However, soft drinks have been singled out. The MRP as at present is Rs 7.50 per 300 ml of bottle.

Catering to Industrial Needs

The Taj group of Hotels, a leader in the Indian hotel industry and inflight catering, was formed in 1902.

Group SHRM of France too was born in the same year and is one of the oldest French institutional catering companies. It has a presence in more than 30 countries worldwide.

In 1996, the Taj group and group SHRM joined hands to form a new corporation named Taj-SHRM Food and Allied Services Ltd, dedicated to institutional food service management and related services. In less than 12 months since inception, the joint venture has secured contracts for catering and allied services form ten important ONGC projects in the Cauvery belt, Leelavati Hospital & Research Centre, ICICI in Mumbai and Apollo Hospital in Hyderabad.

SHRM is an acronym standing for Services Hotel Restaurant Management. The main focus of the group is exclusively on off-shore/marine industries. It has over 200 contracts in the Gulf of Mexico alone, serving ap-

proximately 330 vessels and offshore platforms. Further, the group's other businesses are serving meals to schools in France, to Universities in New Guinea and providing security in Angola, to name a few.

Besides catering, Taj-SHRM looks after housekeeping, laundry, security and gardening too. While oil installations, both offshore and onshore will be catered to, attention will also be paid to securing food service management contracts for hospitals, colleges, corporate buildings, industries and the railways.

Taj-SHRM believes that food, apart from serving the need to have energy, also provides for good morale and a sense of wellbeing.

As much for physiological needs as for psychological ones, food provides comforts and nutrients. Particularly, while planning menus for offshore locations, much has to be thought out including crew preferences, nutritional needs, variety, flavour combinations and appearance, all of which work together in putting out a quality meal.

Taj-SHRM begins by applying its mind on the customer's key parameters such as budget, selection and training of personnel, choice of foodstuffs, all the way to the preparation and service of meals to high quality and hygiene standards.

Though contract catering is the company's core competency, its range of services includes housekeeping and support services as well as total camp services management (gardening, laundry and security).

Indian Sugar Industry Objects to WHO Proposals

The Indian sugar industry has objected to the draft standard for white sugar as circulated by the Codex Alimentarius Commission, an international body for food standards, as it requires that the sulphur content be reduced from 70 mg per kg to 20 mg per kg.

Objecting to the Commission's proposal, president of the National Federation of Cooperative Sugar Factories (NFCFSF), Mr Shivajirao G Patil said that the proposed reduction of sulphur content would involve a huge capital investment of more than Rs 1000 crores. The country's sugar industry could be under pressure and exports affected, if the condition was enforced.

The Codex Alimentarius Commission is a joint commission comprising the Food and Agriculture Organization (FAO) and World Health Organization (WHO) for preparation of food standards and has membership of almost all countries in the world.

The Indian government had sent a delegation comprising government officials, sugar technologists and Industry representatives to Geneva for the 22nd session of the Codex Commission, under the leadership of Mr Patil to prevail upon Britain, the host for WHO's sub-committee on sugar and honey to reconsider the proposal to reduce the permissible level of SO₂ residues in sugar from the present 70 ppm to 20 ppm.

India, the largest producer of plantation white sugar in the world, meanwhile, is making efforts to approach other countries producing white plantation sugar to strengthen their position.

WHO Not to Impose Higher Standards for Sugar

In a major respite for the Indian sugar industry, the World Health Organization (WHO) has decided to reconsider its proposal to impose higher quality standards for sugar in the international market.

If the proposed WHO standards are implemented, Indian sugar will find no buyers in the international market, sources said.

Sources said that the UK agreed to call a fresh meeting of all the members on the sub-committee for their views instead of merely corresponding with them, which had been its practice till now.

As a result, the new proposal has been relegated from "stage seven" in the decision-making process to "stage six".

This has effectively pushed back the decision on new sulphur residue standards for another three to four years. There are eight stages in all to consider and finalize the decisions taken by the WHO committees, sources said.

However, similar quantities of sulphur are also found in several other food items, which are permitted by the WHO.

The new standards for sulphur residues in sugar were first drafted by the UK in July 1995. Realizing the enormous damage they could do to sugar exports from India, the Indian Sugar Manufacturers Association (ISMA) was the first to raise an alarm and asked the Union food ministry in May 1996 to ensure that India's point of view is heard in the WHO meetings.

The food ministry was supportive of the sugar industry's concerns and asked the union health ministry to take up the issue with

the UK. Despite its potential, India continues to remain a minor player in the world sugar trade because of its restrictive domestic policies of licensed production and retailing.

A Blow to Indian Seafood Exports

The European Union has decided to impose a temporary ban on seafood exports from India. The value of seafood exports from India is estimated at Rs. 1,500 crores annually. However, consignments already en route will be allowed to access European markets till August 15, after which no further imports will be allowed.

According to reports from Brussels, the ban follows the discovery by several EU States of *salmonella* and *vibrio* bacteria in imports of frozen and conserved fish or seafood. EU inspectors who visited India also reported widespread hygiene problems in local production and processing facilities. A similar ban on exports of marine products from Madagascar has come into effect simultaneously.

In an official communication, the EU has said the suspen-

sion would be reviewed before November 30, 1997 by which time "it hoped that the Indian authorities would take action to restore confidence".

Reacting to the development, Union commerce minister Mr. B.B. Ramaiah said, "We will initiate measures to improve quality and hygienic conditions of seafood exports in co-operation with the State governments and exporters."

The Indian government is trying to convince the EU to allow uninterrupted exports from companies that meet its hygiene requirements.

The EU hopes that the suspension of imports will encourage the Indian government to review its current list of about 160 approved exporters, to retain only those plants which genuinely meet EU hygiene standards.

India has pointed out that 16 of these 160 exporters already meet the required standards.

While exporters across the country were taken aback by the timing of the EU decision, the vice-chairman of the Kochi-based Marine Products Exports Development Agency (MPEDA) Anwar Hashim said the ban was expected and it was time that Indian marine products exporters behaved themselves.

Last year, India exported frozen shrimp worth \$96 million and \$74 million worth of squid and cuttlefish to the EU.

India, Madagascar and Bangladesh are the three major suppliers of frozen shrimp, squid and cuttlefish to the European market.

With the ban, seafood exports worth Rs. 1,500 crore are likely to be adversely affected.

However, exporters from the other centre at Visakhapatnam are unlikely to be affected much by the ban because most of their produce goes to Japan and Taiwan and South-East Asian countries like Thailand. This is borne out by the export figures obtained from MPEDA.

Local exporters shipped out 11,677 tonnes of products to Japan alone, out of the total exports of 18,544 tonnes in 1996-97. In rupee terms, exports to Japan realized Rs. 422 crores of the total of Rs. 521 crores.

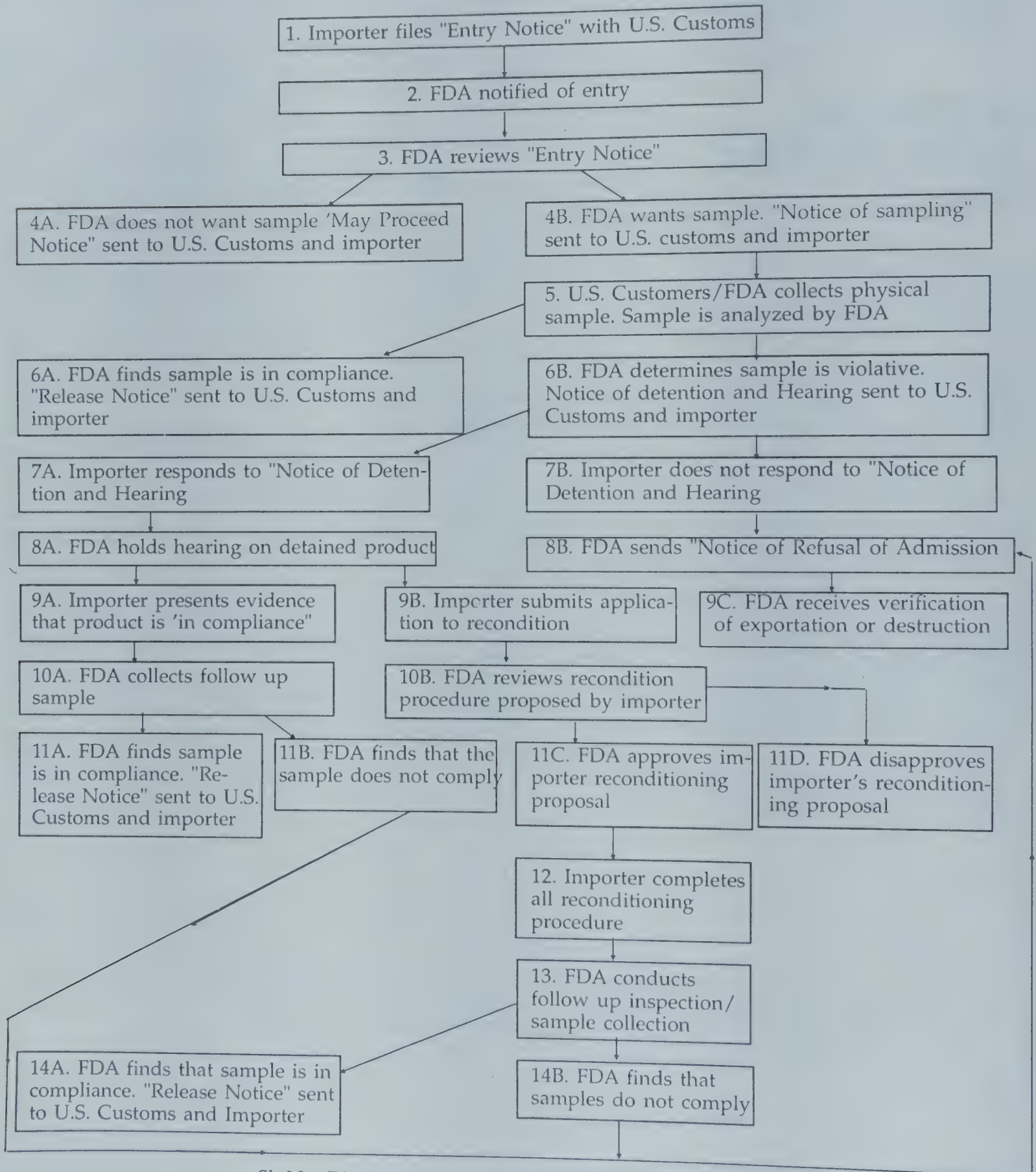
Intriguingly, neither the Marine Products Export Development Authority (MPEDA) nor the Seafood Exporters Association (SEA) has any authentic information about the ban.

ERRATUM

Ref : Feature Article entitled "New Applications of Extrusion Cooking Technology" appeared in Indian Food Industry (1996) Volume 15, No. 6 pp 14-23. The name of the first author should read as A. C. Smith, instead of R. C. Smith. The error is regretted.

- Editors

FDA PROCEDURES FOR HANDLING IMPORTED FOODS INTO USA



Sl. No. 7A, 9A, 9B and 12 are importer's responsibilities.

VIEWS

Relevance and Realities of Technology Development in Evolving Market Economics

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(We have opened a new column called 'VIEWS' to permit eminent consultants, academicians and policy-makers to air their views on matters of prime importance to the Indian Food Industry. It is hoped that this new feature will facilitate to set in motion the process of serious thinking, situation assessment and action planning among the concerned people. It could also serve as a forum for debate where diverse opinions and views are expressed. Towards these ends, the VIEWS column, which as of now will be on invitation, will allow freedom of expression, not necessarily congruent with the Journal's views -

Chief Editor)

Dynamics of Technology Development

Resources in a country need to be deployed most strategically through research and development (R&D) with the following objectives (i) assisting/strengthening of industry, (ii) developing new technologies to make industry more competitive amongst themselves nationally as well as internationally, (iii) ensuring for the nation leadership in critical technologies with least dependence on others, (iv) evolving improved technologies to supplement the existing ones, (v) raising the capabilities

of the country for assessment and (vi) selection of frontier technologies *vis-a-vis* societal obligations, most important of which is raising the living standards of the population. The role as a prime mover of R&D is often assumed by the government in centrally controlled economy countries and newly emerging countries from colonial rule, sharing more than 95% of the total R&D expenditure. In market driven economies, the private sector takes over this function and government's role is

A reasonable degree of technological self-reliance is the minimum need for any country aspiring to achieve the status of a developed country and a viable R&D system only can help to realise this objective.

limited to evolving conducive policies and creation and maintenance of infrastructure so essential for industrial development and

sustained growth. There is a direct relationship between R&D expenditure and the developmental status of countries, higher investment being synonymous with levels of development. Both in absolute terms and as a percentage of GDP expended on R&D activities, developed countries stand way ahead of others and consequently monopolise the international trade through their cutting edge technologies. A reasonable degree of technological self-reliance is the minimum need for any country aspiring to achieve the status of a developed country and a viable R&D system only can help to realise this objective.

R&D Failures

High investments in R&D in any and every environment do not automatically ensure success. Though R&D has an element of risk, since it indulges in the realm of unknown and uncharted areas, often the failure is attributed to three main factors. These include (a) lack of strong industrial base in many developing countries, which is normally supposed to precede any need for R&D and consequently lack of focus for any meaningful R&D effort and high failures in technology generation and absorption, in contrast to the situation prevailing in developed countries (b) very slow

* Chairman

development and growth of the industrial sector compels R&D to go parallel, with apparently no meeting points for any interaction and simultaneous efforts, invariably leading to irrelevant and unutilizable R&D outputs (c) adherence to the antiquated practice of pipeline system of R&D management based on sequential development, where considerable time, money and efforts are invested in just proving the technical viability of a concept. Often, wide perceptual differences occur over the relevance, utility, adequacy, completeness and cost-effectiveness of the work between the R&D groups and the potential users. As a result, technology transfer efforts are severely handicapped. Modern day R&D calls for technology integration by creating composite teams representing researchers and others involved in product design, manufacturing, marketing and end users. It is for

Modern day R&D calls for technology integration by creating composite teams representing researchers and others involved in product design, manufacturing, marketing and end users.

this reason that private initiatives in R&D are more successful than their government counterparts. Ingredients for successful R&D include : a high degree of capability for opportunity engineering, a pronounced end-user orientation for integrating technology with upstream end of research, sound project management, good inter-

face with complementary disciplines, adequate market support, supportive organization structure and a good leadership. The fragile public R&D-industry nexus is attributable to the existence of mutual mistrust between them. Industry often entertains serious reservations regarding the ability of public R&D to maintain confidentiality/secretcy, which is vital for survival in a fiercely competitive environment. Industry is weary about the slackness in the system as manifested by slow response and time insensitivity; feels that the R&D facilities are out-dated and not maintained for optimal performance to yield a reasonable the output; has a poor opinion about the scientific community as a whole working in government organizations regarding their business sense and ability to discern what is relevant to their needs; perceives the scientist as hostile and indifferent towards them. On the other hand, the scientific community's image of the industry is that of a bully, cunning, exploitative, disrespectful, excessively obsessed with profiteering, immune to societal problems, deliberately ignoring their contributions and not granting recognition where and when it is due . R&D can hope to succeed only if this mistrust and misconception are dissolved and mutual respect is built up, as each of them has a role to play in the industrial development.

Quality of R&D Management

An efficient R&D system is founded on a body of resourceful people with high innovation potential and a modern supportive infrastructure. The success or failure often depends on the quality of leadership available at different levels. The essential qualities which are hallmarks of an effective leadership include (i) the ability to manage uncertainties with foresight, (ii) understanding

and managing factors involved in interfacing as R&D, especially in a complex area like food invariably is multi-disciplinary in nature, (iii) a high level of capability to manage creativity and human beings, experience in managing and overcoming obstacles (iv) daringness to lead rather than direct and (v) providing guidance to workers rather than controlling them. Encouragement and nurturing are vital for generating and retaining leaders capable of shouldering R&D management responsibilities. Successful management calls for many attributes which include (i) instilling unquantifiable pride and loyalty, (ii) willingness for any sacrifice and unquestionable integrity; (iii) sound qualification and a composite experience in basic research, applied research, technology productionisation, industry management with ability to guide all areas of research, discern good

Industry often entertains serious reservations regarding the ability of public R&D to maintain confidentiality/secretcy, which is vital for survival in a fiercely competitive environment.

research, evolve a vision for the organization, command respect from the workers through achievement rather than power and authority, discern commercial significance of the research output; (iv) enjoy a good standing among peers and professionals nationally and internationally; (v) keep abreast of newer developments;

have an intimate understanding of the industrial landscape and social and cultural ethos of the country; (vi) humility and willingness to recognize and appreciate goodness and talents in others; (vii) a close personal understanding of workers, their strength, weakness and vulnerability (viii) high degree of self-motivation and ability to motivate others to realise the full potential of the available human resources; (ix) possess a mind under continuous turmoil constantly yearning for new ideas and concepts; (x) receptive to changes, option analysis and goal setting; (xi) stature to rub shoulders with captains of industry; and (xii) qualities like patience, perseverance, persistence, positive outlook, helpful attitude, ever obliging without compromising on principles and interests of the organization, tolerate/welcome constructive criticism, reconcile divergent views to evolve consensus, limit discontent through prompt grievance redressal, fearless to take quick, even unpopular decisions in the larger interests of the organization and a high degree of sensitivity to time management.

Weak Spots in R&D Systems

If public funded R&D presently prevalent in many countries, is perceived as not very effective compared to its private sector counterpart, there are strong reasons at the organizational levels which can be considered responsible for it. These include (i) ill-defined direction for R&D with unclear and shifting objectives; (ii) uncertainty regarding the project mix *vis-a-vis* social and commercial objectives, (iii) low level of motivation for the staff insufficient for self-priming to innovate; (iv) inadequate initiative, involvement, accountability and time sensitivity,

(v) feeling of disenchantment; lack of pride being a part of the organization, low level of self confidence amongst the staff; (vi) aging infrastructure and people with very slow pace of replacement and upgradation, imbalance in staff profile with progressively narrowing specialization and non-existence of retraining mechanism; (vii) mistrust amongst basic, applied, engineering and supporting scientific groups due to fear syndrome *vis-a-vis* credit cornering; rigid bureaucracy with no scientific temper; (viii) lax system of achievement auditing and absence of independent

An efficient R&D system is founded on a body of resourceful people with high innovation potential and a modern supportive infrastructure.

mechanism to assess quality of R&D outputs and intellectual property claims; (ix) lack of aggressive approach towards business development and (x) prevalence of 'solo' research syndrome, absence of award/reward/punishment system and lack of leadership building efforts contribute to a bloated staff with decreasing productivity and unfavourable cost effectiveness of R&D. Many of the above ills afflicting public funded research are not encountered in private R&D organization, which have their own code of operation, different

from government bureaucracy, designed to achieve high creativity, productivity and excellence with least inputs.

Shared R&D - The Likely Future Trend

Escalating cost of R&D is casting a great burden on the industry and ultimately it is to be shared by the consumers. Whether public-funded R&D has any role at all in future, is a question exercising the minds of planners. But it has to be conceded that the private sector R&D in these countries will take a long time, efforts and investments to build the required muscle will be counted and public funded research will have to provide support during the transition. Considering that many countries, striving to switch over to market driven economic system have a large number of small and medium scale industries which cannot hope to commit large investments in R&D for long term benefits, future scenario will have to be drawn envisaging co-existence and shared responsibilities between industry and the government. In this context, it may be appropriate to anticipate a futuristic trend, where industry will depend on public-funded R&D for developing products and technologies by mutual consultation and sharing of expenditure through contribution in the form of cess or levy to the government. It will be for the industry to dip into this technology/product kitty for their needs and do further developmental work such as fine tuning, repackaging, remodelling, redefining, adapting and overhauling, based on their individual market perception and investment capacity.

FEATURE ARTICLES



An Appraisal of Nutrient Composition of Popular Health Beverages *vis-a-vis* Sanctity of Labelling

Consumers of Processed Fruit and Vegetable Products : An Analysis of Buying Behaviour

HACCP Through ISO 9000 Quality Management System

An Appraisal of Nutrient Composition of Popular Health Beverages *Vis-a-Vis* Sanctity of Labelling

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Introduction

Food and medicine form a potential combination to fight diseases and maintain health. Galen, Father of Observational Medicine, believed that fundamentals of good medicine lay in the diet. Virtually, all systems of traditional medicine in China, India and Egypt incorporated food modifications as significant components of treatment. As a corollary to this concept, Western food industry was built around the conviction that certain foods or dietary patterns could cause or cure disease. In this context, Harrey, Kellogg and Post founded great American food companies with an assurance of providing good health to consumers using their products.

The Indian Scenario

Until a few decades ago, for a vast majority of people in our country, fast foods were synonymous and associated with the Shaheb's foods, which were considered expensive, unnatural and synthetic and were certainly out of reach for the masses in terms of price as well as availability. However, within the last two decades, a revolutionary change has taken place in this area

and indeed the process of this change is continuing to accelerate rapidly and packaged foods have become the "IN" thing of today at

Providing essential information on the package about the composition would enable the consumer to make a better choice among the large number and variety of the palatable and processed foods offered in the market, which have a nutrient composition very different from the traditional foods.

the households, for the retailers and for the entrepreneurs including large business houses and multinationals (Puri and Tajinder, 1987).

The increased consumption of pre-cooked or processed foods, necessitates the establishment of nutritional and labelling guidelines. Providing essential information on the package about the composition would enable the consumer to make a better choice among the large number and variety of the palatable and processed foods offered in the market, which have a nutrient composition very different from the traditional foods.

In the past, nutritionists and dietitians could feel reasonably certain that consumers could make the connection between the basic four food groups and the products they saw in the supermarket, which is not so now with synthetic processed foods.

Nutrition Information on Labels - An Essential Component

Need for providing nutrition information to the public within the context of broader health education policy recognizes the potential for food labels along with advertising to inform the public about the relationship between diet and health (ADA, 1989). In-

egrated help from nutritionists to the public in understanding nutrition by translating the science of nutrition, including dietary guidelines and label information will enable healthy food choices by the consumer, among large number and variety of the products offered in the market and in particular, among those which being similar in appearance, incorporate differences to a larger or lesser extent (Norman, 1976 ; Foster, 1990). Nutritional labelling enables the consumer to compare products at the time of purchase for choosing healthy diets for themselves and their families (Foster 1990).

Nutritional labelling is a tool that can be exploited for educational purposes. The comprehensiveness of the listed nutrient will be particularly significant in meeting the informational needs of a broad spectrum of consumer concerns and knowledge levels. It is not true that the provision of nutrition information is going to turn the average customer into a nutritionally aware individual overnight but the provision of nutrition labels and nutrition advice would be a beginning for thousands of shoppers, who are concerned about choosing healthy diets for themselves and their families (Foster 1990). Nutritional labelling will support the educational need by promoting awareness and familiarity with nutrition terminology and with nutrient information on specific food products. It is soundly based on some continued index of nutritive quality that sacrifices accuracy with oversimplification (Moore and Wendt 1973).

Compositional standards are a double-edged tool for the consumer. On the one hand, they do maintain a certain basic standard and enable the consumer to place an element of trust in established product descriptions and in the names of traditional foods. They can protect consumers against fraud and exploitation. On the other, they can impede progress

especially in relation to the increasing demand for healthier products (Foster, 1990). Labelling would en-

Nutritional labelling enables the consumer to compare products at the time of purchase for choosing healthy diets for themselves and their families.

courage the production of nutritious foods by rating them according to the level of nutrients present (Babcock and Murphy, 1973).

Health Beverages

We are in an era now, in the middle of the major change in the outlook in Indian medicine and therapeutic nutrition with both physicians and consumers viewing

The comprehensiveness of the listed nutrient will be particularly significant in meeting the informational needs of a broad spectrum of consumer concerns and knowledge levels.

diet as a component not only for achieving good health but also for its maintenance and possible improvement. The attention, at present, has been focussed towards

manufacturing food formulations in a variety of forms, to cater to diverse situations encountered in the growth and maintenance of health.

Health beverages, a major segment in the food industry, serve as dietary supplements, rich in vital nutrients that can be easily digested and assimilated. Active ingredients are in a balanced proportion and they serve to strengthen the body and activate all the physiological functions. The important advantages of health foods are : i) Combat stress and fatigue ; ii) Inspire mental and physical performance ; iii) Build up resistance to infections; iv) Promote vitality; v) Help recoup-

Health beverages, a major segment in the food industry, serve as dietary supplements, rich in vital nutrients that can be easily digested and assimilated.

ment during convalescence; vi) Supplement lactating and nursing mother's diet and vii) Support growth of growing children.

Information Available on Labels of Health Beverages

An effort was made to carry out the content analysis of eight popular commercially available health beverages. The nutrient contents were determined for comparison with respect to the following aspects detailed in the labels :

i) Date of manufacture and expiry ii) Storage instructions on bottles and refill packs ; iii) Usage instruction; iv) Approval seal;

v) Ingredients: specified and amounts; vi) Preservatives: mentioned, specified and amounts; vii) Nutrients: specified and amounts; and viii) Target groups: mentioned and specified.

Label Claims - A Critical Review

A close observation on each of the above aspects especially on the nutritional information revealed that most of the products have been claimed to be a nutritious health beverage for growing children with coloured pictures of active, energetic children.

The health beverages seem to be used as a synonym for energy as most of the products appeal to the consumers as energy-rich foods needed for growing children.

However, these products can be consumed by persons of all

ages. They especially cater to supplement the diets of the old and

The health beverages seem to be used as a synonym for energy as most of the products appeal to the consumers as energy-rich foods needed for growing children.

convalescents. Moreover, all the nutrients of a processed food should be outlined clearly with amounts in order to facilitate the computation of dietary intake. This is of paramount importance in view of the increase in the con-

sumption of such products. Scientific, systematic labelling would also encourage the production of nutritious foods by rating them according to the level of nutrients present.

While the names of ingredients have been listed, the amounts of each of these have not been declared. There is a growing concern and awareness of consumers, especially the group that consumes these beverages, on the chemical preservatives, colours and flavours. All the products analyzed in this study included a general statement 'Permitted colours and flavours' (Table 1).

All the aspects analyzed for in this study are of equal impor-

The scientific evidence should be reassessed periodically by leading organizations in the field to be certain that the health claims are justified.

tance and a single missing aspect leads to inadequacy of labelling. The actual nutrient composition of the health beverage correlated with that claimed on the labels in only 25% of the products analyzed (Table 2). There is a large deviation of values of nutrients claimed on the labels in comparison with the values upon analysis. The incompleteness of nutritional labelling in the products with regard to macro- and micro-nutrients in the products analyzed is also reflected in the same Table.

Conclusion

This survey reflects the inadequacy of information on the labels of health beverages. Only

Table 1. Percentage of the Products Complying with Selected Criteria for Nutritional Labelling

Criterion	% Compliance
Date	
Manufacture	100
Expiry	25
Storage Instructions	
Bottles	37.5
Refill packs	50.0
Usage Instructions	100.0
Approval Seal	12.5
Ingredients	
Specified	100
Amounts	100
Preservatives	
Mentioned	0
Specified	0
Amount	0
Nutrients	
Specified	87.5
Amounts	75.0
Target Groups	
Mentioned	100.0
Specified	12.5

Table 2. Comparison of Analyzed and Labelled Values for Nutrients in Health Beverages

Nutrient	Analyzed values (1)	Labelled values (2) ^a	% Products tallying between (1) & (2)	Average mean deviation range (%) ^b
Carbohydrates (kcal)	55.9 - 81.25	39.6-55.9 (2)	12.5	1.6, 36.33
Proteins (g/100g)	7.53 - 27.84	20.0 - 25.0 (2)	25.0	3.84, 7.19
Fat (g/100g)	1.36 - 15.30	16.00 (2)	12.5	-4.57, -16.64
Vitamin A (mg/100g)	2.70 - 11.70	3.7 - 450 (6)	0.0	-46.43 to 51.94
Vitamin B ₁ (mg/100g)	3.60 - 5.85	0.3 - 1.2 (6)	12.5	79.04
Vitamin B ₂ (mg/100g)	1.86 - 5.58	0.59 - 1.3 (6)	0.0	62.37
Vitamin B ₁₂ (mcg/100g)	1.77 - 2.26	0.37 - 2.2 (5)	25.0	- 8.49 to 80
Calcium (g)	0.39 - 0.87	0.26 - 0.82 (4)	37.5	-40.00 to 55.17
Phosphorus (g)	0.28 - 0.74	0.31 - 0.78 (3)	37.5	-10.71 to 4.44
Iron (mg)	4.0 - 15.0	3.5 - 10.4 (4)	12.5	32.34
Sodium (g)	0.44 - 0.89	0.40 - 0.42 (2)	0.0	41.67
Potassium (g)	0.45 - 1.30	0.57 - 1.27 (2)	12.5	3.45

^a Figures in parentheses indicate the number of products displaying the nutrient on the label

^b Deviation range % refers to the positive or negative deviation of the labelled value from the analyzed value calculated by Analyzed value - Labelled value x 100 / Analyzed value

one out of the eight products analyzed was complete with reference to majority of the parameters looked into which was highly unappreciable. The claims on health beverages should be aimed on the following lines.

1. The consumer should be informed about the macro- and micro-nutrients supplied by the processed food and in turn, its benefits.

2. The health claims should be based on scientific, sound information and these must not imply benefits that have not been adequately proved.

3. No single food or single nutrient should be prompted as the sole basis to good health.

The scientific evidence should be reassessed periodically by leading organizations in the field to be certain that the health claims are justified.

Even to the nutritionally uninitiated consumer, labelling and nutrition information speak for the products themselves and serve as a means for product to product comparison.

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Consumers of Processed Fruit and Vegetable Products : An Analysis of Buying Behaviour

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Introduction

The ability to extend the period of availability of food and food combinations in preserved forms that retain their nutritive value and palatability has improved the health of humans, added variety to the diet and reduced the time for food preparation. The technology of processing has greatly expanded the market for farm products both at home and abroad. The increased need for processed fruit and vegetable products has resulted from rising standard of living, the desire for a more diversified diet the year around, an expanding urbanization and an increase in population. To fulfil this need, various new processed products are entering into the market.

To successfully market the products to different market segments, the marketing manager needs appropriate marketing strategies, which he can design only, when he understands the factors, which account for these differences in consumer behaviour and tastes.

Consumer behaviour is the study of why, how, what, when, where and how often do

consumers buy and consume different food products. The study of consumers' behaviour also provides an insight into how consumers arrive at the purchase decision and the variables, which influence their decision. Once the influencing variables have been identified, the marketer can manipulate them so as to induce

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his consumers to take a positive purchase decision.

A study of consumer behaviour is helpful in understanding the purchase behaviour and preferences of different market segments.

Consumers differ in terms of their age, education, occupation, income, family set-up, religion,

nationality and social status. The importance of consumer behaviour lies in the fact that behaviour can be understood and influenced to ensure a positive purchase decision. The marketing manager's interest lies exactly here i.e., to ensure that his marketing strategy results in the purchase of the product.

It is in this backdrop that a study on the buying behaviour of consumers of processed fruit and vegetable products was conducted in the Udham Singh Nagar district of Uttar Pradesh with the following objectives :

1. To estimate the consumption pattern of processed fruit and vegetable products, and
2. To analyze the buyers' decision process regarding branding and packaging of processed fruit and vegetable products and also to examine the purchase pattern.

Research Methodology

The basic method of exposition is conceptual model of consumer motivation and behaviour (Table 1). The model specifies relevant variables that shape the consumers' actions and the ways in which each fits into a

Table 1. A Model of Consumer Behaviour

	External influences	
Input	Marketing stimuli	Other stimuli
	Product	Technological
	Price	Political
	Promotion	Social
	Channel of distribution	Cultural
	Consumer decision making	
Process	Buyer characteristics	
	Psychological	
	Social	
	Cultural	
Output	Consumer decisions and actions	
	Product choice	
	Brand choice	
	Dealer choice	
	Purchase timing	
	Purchase amount	

buying decision.

A consumer's decision to purchase a particular product is the result of complex interplay of number of variables. The starting point for the decision process is provided by the marketing stimuli in the shape of product, promotion, price and distribution strategy.

The marketing stimuli are received by the potential consumer along with the other stimuli already existing in the environment. These stimuli may be social, political, cultural and/or technological in nature. At the point of receiving the marketing stimuli, the consumer already has a certain mental, emotional and psychological frame of mind developed over the years by his cultural, religious, social, family and psychological background. However, most of these factors exert their influence at the sub-conscious level so that the consumer is not really aware of their existence or working.

When a stimulus is received, the consumer goes through an elaborate process of decision making in terms of receiving, retaining, interpreting and

The starting point for the decision process is provided by the marketing stimuli in the shape of product, promotion, price and distribution strategy.

evaluating it according to his own framework. Depending on the nature of product being purchased, this process may work at the sub-conscious level or it may be overt. The time taken to make the decision may vary from a few

seconds to a few days or months. The buyer characteristics and buyer decision making process in conjunction with marketing stimuli lead to a decision to either buy the product or not to buy.

Three villages and towns/cities of district Udham Singh Nagar were randomly selected for the study. The study was based on a systematically drawn sample of 100 respondents, having 20 consumer-buyers from each segment (class). Five market segments of the consumer-buyers of processed products of fruits and vegetables were identified in the study viz., farming class, non-farming rural class, business class, service class having a regular employment in organized sector and consumer-buyers of service class families engaged only on temporary employment. First, two segments were formed for rural consumers, while the last three were formed for urban consumer-buyers. Though a large number of processed fruit and

Table 2. Percent Distribution of Jam Consumer-buyers

Particulars	Business class	Regular service class	Temporary service class	Farming class	Overall
Consumer's percentage	75	80	10	60	45
Per capita per day consumption (gms)	4.99	2.81	1.83	2.45	3.02
Percent consumer-buyers using the brand					
- Brand A	66.67	75.00	100.00	57.14	68.97
- Brand B	11.11	16.67	-	-	10.34
- Brand C	11.11	-	-	14.29	6.90
- Brand D	11.11	8.33	-	28.57	13.79
Final decision maker about a brand					
- Husband	22.11	16.67	100.00	42.86	27.59
- Wife	11.91	8.33	-	14.29	10.34
- Husband-wife	33.33	33.33	-	14.29	27.59
- Children	22.22	25.00	-	14.29	20.69
- Husband-wife-children	11.11	16.67	-	14.29	13.79
Percent buyers purchasing in					
- retail	66.67	83.33	100.00	71.43	75.86
- wholesale	33.33	16.67	-	28.57	24.14
Percent buyers prefer					
- glass bottle	55.55	66.67	100.00	85.71	68.97
- glass jar	22.22	16.67	-	14.29	17.24
- plastic jar	22.22	16.67	-	-	13.79
Percent buyers loyal to a particular brand	44.44	66.67	100.00	71.43	58.62
Percent buyers viewing the advertisements of the product	44.44	58.33	-	42.86	48.28
Percent buyers sticking to the same brand consequent to rise in price	55.86	83.33	100.00	57.14	68.97

Continued

Table 2. (Continued)

Particulars	Business class	Regular service class	Temporary service class	Farming class	Overall
Percent buyers sticking to the same brand consequent to rise in price	55.86	83.33	100.00	57.14	68.97
Percent buyers likely to shift to another brand if price rises	44.44	16.67	-	42.86	31.03
Percent buyers likely to increase their consumption consequent to decline in price	33.33	25.00	-	28.57	27.59
Percent buyers likely to try a new brand of jam if introduced	77.78	66.67	100.00	57.14	72.41

vegetable products were available, only the common products were included in the study. The selected products were jam, pickle, vegetable squash, fruit's squash and *murabba*.

Results

The results are presented and discussed product-wise as follows :

Jam

In the sample, only 45% respondents (households) were found buying and consuming jam and thus the analysis pertained only to households consuming jam. The consumption and buying behaviour of jam is given in Table 2. In non-farming rural class, the consumption of jam was found to be nil. In temporary service class, only one respondent was found purchasing jam from the market.

Brand mix : Only four brands of jam are found used by sample buyers. In urban temporary

service class and rural households (in farming class), buying decision process was dominated by the male heads of the family. In business and regular service classes, decision making was husband-wife dominated. To identify the reasons for purchasing jam of a particular brand, several quality attributes were identified. Based on the response, the attributes were ranked, as shown in Table 3.

Based on the analysis, flavour (taste), good quality and low price could be identified as basic attributes in selection process for a particular brand of jam. Classwise variations were, however, found existing in respect of determining attributes.

Purchase pattern : The study has revealed that 75.86% sample buyers purchased jam in retail. As far as the packing was concerned, the preference was given to glass bottle packing in all the classes. The brand loyalty was found in

58.62% sample buyers. The remaining buyers could be easily prompted to change the brand they used. The advertisements of jam were reportedly watched by 48.28% sample households.

Simulated behaviour : Sample buyers' reactions were also analyzed for anticipated changes like price change and introduction of new brand. It is reported that about 68.97% sample buyers would be sticking to the same brand even if price of a particular brand of jam increased, whereas 31.03% would like to switch over to another brand. It is also interesting to note that if the price of jam was reduced, only 27.59% sample buyers were likely to increase their jam consumption, while 72.41% would continue with the existing level. If a new brand of jam was introduced, 72.41% sample buyers were ready to try that.

Pickles

The regular consumption of

Table 3. Ranking of Attributes-mix for Preferring a Particular Brand of Jam

Attributes mix	Percent positive responses	Relevant classes with percentage of consumer-buyers with positive responses
Good flavour, good quality and low price	27.59	Temporary Service (100.00), business (33.33), farming (28.57), regular service (16.67)
Good flavour, good packing and low price	17.24	Regular service (25), farming (14.29), business (11.11)
Low price	13.79	Regular service (16.67), farming (14.29), business (11.11)
Good flavour and packing	13.79	Business (22.22), farming (14.29), regular service (8.33)
Low price and easy availability	13.79	Regular service (16.67), farming (14.29), business (11.11)
Good flavour (taste)	3.45	Business (11.11)
Advertisement	3.45	Regular service (8.33)
Low price, colour and good packing	3.45	Regular service (8.33)
Good quality	3.45	Farming (14.29)

pickles was found in 77% sample households, the overall per capita per day consumption of pickle being 2.78 g. The consumption of pickle was found the highest in regular service class and the lowest in non-forming rural class (Table 4).

Brand mix : In all, five brands of pickles were found used by sample buyers. The decisions of husband and husband-wife jointly were found dominating in buying pickles among sample households.

Six groups of attributes were identified as the reasons of choosing a particular brand by sample consumer-buyers of pickles. The relative importance of

attributes mix is shown in Table 5.

Based on the analysis, good taste, good quality, low price and ease in availability could be identified as the basic attributes in selection process for a particular brand of pickle.

Purchase pattern : Among the sample buyers, 62.5% purchased pickle in retail and 25% were found brand specific. Overall, the glass bottle packing for pickle was preferred most by sample buyers. The advertisements of pickles were watched by 56.25% sample respondents.

Simulated behaviour : It is reported that about 31.25% sample users would continue with existing

brand even if the price of the particular brand was increased. This revealed the low level of brand loyalty for pickle. Remaining 68.75% were likely to shift to another brand, if the price of brand in use rose, but would not cut the level of consumption. In case of price decline, 62.5% respondents reported that they would continue with the existing level of pickle use. Further, as many as, 81.25% of current users were likely to try a new brand, if introduced.

Sauce

Overall, percentage of consumer-buyers of sauce in the sample was found to be 38 with no

Table 4. Percent Distribution of Pickle Consumer-buyers

Particulars	Business class	Regular service class	Temporary service Class	Farming class	Non-Farming rural class	Overall
Consumer's percentage	100	100	55	90	40	77
Per capita per day consumption (g)	3.16	5.05	1.11	3.94	0.95	2.78
Percent buyers using the brand						
- Brand E	33.33	66.67	50.00	50.00	-	43.75
- Brand F	16.67	33.33	50.00	25.00	-	25.00
- Brand G	33.33	-	-	25.00	-	12.50
- Brand H	16.67	-	-	25.00	-	12.50
- Brand I	-	-	-	-	100.00	6.25
Final decision maker						
- Husband	33.33	33.33	50.00	50.00	100.00	43.75
- Husband-wife	50.00	66.67	50.00	25.00	-	43.75
- Wife	16.67	-	-	25.00	-	12.50
Percent buyers purchasing in						
- retail	33.33	66.67	100.00	75.00	100.00	62.50
- wholesale	66.67	33.33	-	25.00	-	37.50
Percent buyers prefer						
- glass bottle	33.33	33.33	50.00	25.00	100.00	37.50
- glass jar	50.00	-	-	50.00	-	31.25
- plastic jar	16.67	16.67	-	25.00	-	25.00
- loose packing	-	-	50.00	-	-	6.25
Percent buyers loyal to a particular brand						
	16.67	33.33	-	50.00	-	25.00

Continued

Table 4. (Continued)

Particulars	Business class	Regular service class	Temporary service class	Farming class	Non Farming rural class	Overall
Percent buyers viewing the advertisement of the products	66.67	100.00	50.00	25.00	-	56.25
Percent sample buyers sticking to the same brand even if price of the product rises	33.33	33.33	-	50.00	-	31.25
Percent buyers shifting to another brand in the event of price rise	66.67	66.67	100.00	50.00	100.00	68.75
Percent buyers likely to increase their consumption if price of the product increases	16.67	66.67	50.00	25.00	100.00	37.50
Percent buyers trying a new brand, if introduced	83.33	100.00	50.00	75.00	100.00	81.25

buying reported in non-farming rural class. The overall average per capita per day consumption was found to be 2.11 g in the sample. Various types of sauces like tomato sauce, chilli-tomato sauce, chilli-sauce and chilli-garlic sauce were being consumed. The buying behaviour of sauce consumers is presented in Table 6.

Brand mix : The decision making about a particular brand was found husband dominated in farming (50%) and temporary service class (40%), whereas children dominated in regular service class (30.77%) and husband-wife dominated in business class (28.57%).

To identify the reasons for

purchasing sauce of a particular brand, several quality attributes were identified. Based on the response, the attributes were ranked as shown in Table 7.

Purchase pattern : The study revealed that 52.63% consumer-buyers purchased sauce in retail. It was noted that 36.84% consumer- buyers were indifferent

Table 5 : Ranking of Attributes Mix for Preferring a Particular Brand of Pickle

Attributes mix	Percent families consider	Relevant classes with percentages of consumer-buyers with positive responses
Price, taste and quality	37.50	Temporary service (50), farming (50), business (33.33), regular service (33.33).
Price, availability and taste	31.25	Non-farming rural (100), regular service (66.67), temporary service (50), business class (16.67)
Price and taste	12.50	Farming (25), business class (16.67)
Flavour and taste		Business families (16.67)
Availability	6.25	Farming (25)
Colour, price and quality	6.25	Business class (16.67)

to the brands of sauce.

Simulated behaviour : It was revealed that 52.63% the buyers

would continue with the same brand, even if price of that particular brand sauce rose, while

47.37% were likely to shift to another brand, whose price had not increased. Only 21.05%

Table 6 : Percent Distribution of Sauce Consumer-buyers

Particulars	Business class	Regular service	Temporary service class	Farming class	Overall
Consumer's percentage	70.00	65.00	25.00	30.00	38.00
Per capita per day consumption (g)	11.67	13.70	9.53	8.90	10.97
Percent buyers using the brand					
- Brand A	35.71	23.08	60.00	33.33	34.21
- Brand J	64.29	76.92	40.00	66.67	65.79
Final decision maker					
- Husband	21.43	23.08	40.00	50.00	28.95
- Wife	14.29	15.38	20.00	-	10.53
- Husband-wife	21.43	30.77	20.00	-	21.05
- Children	28.57	7.69	20.00	33.33	23.68
- Husband-wife-children	14.29	23.08	-	16.67	15.79

Continued

Table 6 : (Continued)

Particulars	Business class	Regular service	Temporary service class	Farming class	Overall
Percent buyers purchasing in					
- retail	42.89	61.54	80.00	33.33	52.63
- wholesale	57.11	38.46	20.00	66.67	47.37
Percent sample buyers viewing the advertisements of the product	42.89	61.54	20.00	33.33	44.24
Percent buyers loyal to a particular brand	71.43	61.54	60.00	50.00	63.16
Percent buyers sticking to the same brand consequent to rise in price	57.14	53.85	40.00	50.00	52.63
Percent buyers likely to shift to brand consequent to rise in price	42.89	46.13	60.00	50.00	47.37
Percent buyers likely to increase their consumption consequent to decline in price	14.29	23.08	20.00	33.33	21.05
Percent buyers trying a new brand if introduced	64.29	84.62	60.00	33.33	65.79

consumer buyers reported that they would increase the consumption of sauce, when its price decreased. Of the total sample of consumer-buyers, 65.79% were ready to try a new brand of sauce, if introduced.

Fruits squash

Buying of fruit squash was found only in 33% sample households. The overall per capita per year consumption of squash was only 227.26 ml. The per capita per year consumption was found maximum in regular service class (355 ml), followed by business

class (232 ml), farming class (162 ml) and temporary service class (160 ml). The consumption of squash was found to be nil in non-farming rural class. Mainly, four types of squashes were being consumed in the sample viz., orange, pineapple, lemon and mango squash. (Table 8).

Table 7 : Ranking of Attributes-mix for Preferring a Particular Brand of Sauce

Attributes mix	Percent positive response	Relevant classes with percentage of consumer-buyers with positive response
Price, taste and quality	18.42	Temporary service (40), business (21.43), regular service class (15.38).
Taste/flavour and availability	15.79	Temporary service (20), farming (16.67), regular service (15.38), business (14.29)
Quality, taste and advertisement	15.79	Regular service (23.08), temporary service (20), farming (16.67), business (7.14)
Quality	15.79	Farming (33.33), temporary service (20), business (14.29), regular service (7.69)
Quality and availability	13.16	Farming (33.33), business (14.29), regular service (7.69)
Taste/flavour	10.53	Business class (21.43), regular service (7.69)
Availability and quality	7.89	Regular service (23.08)
Availability	2.63	Business (7.14)

Two brands of squashes were found popular among sample consumer- buyers. The decision making was found husband dominated in all the classes for choice of a particular brand of squash. The reasons for preference about a particular brand were analyzed from the response of consumer-buyers and the results are given in Table 9.

Based on the analysis, taste, quality and price were found important factors influencing the decision making about a particular brand. Classwise variations were, however, found existing in respect

of determining attributes.

Simulated behaviour : Out of the total sample of consumer-buyers of squash, 69.70% were found to be brand specific. The brand loyalty was further established from the response that 72.73% sample buyers would continue with the same brand in the event of price rise of squash. Only 6.06% squash buyers would like to increase their consumption, if price of squash declined. Further, 54.55% squash buyers were ready to try a new brand of squash, if introduced. The packing of squash in glass

bottle was liked by all consumer-buyers.

Murabba

Murabba was found consumed by only 17% sample respondents. The average per day consumption of murabba was 2.86 g per day. Mainly three types of murabba were consumed in the sample viz., *amla* (78.02%), apple (9.89%) and carrot (12.09%). Among the sample respondents, who purchased murabba from the market, all the consumer-buyers, except one, consumed murabba of local brand. Therefore, classwise analysis was not done. Only two

Table 8 : Percent Distribution of Squash Consumer-buyers

Particulars	Business class	Regular service class	Temporary service class	Farming class	Overall
Consumer's percentage	65.00	55.00	25.00	20.00	33.00
Per capita per year consumption (ml)	232.27	355.00	160.00	161.76	227.26
Percent buyers using the brand					
- BrandA	76.92	90.90	100.00	50.00	81.82
- Brand K	23.08	9.10	-	50.00	18.18
Brand decision maker					
- Husband	38.46	36.36	60.00	75.00	45.45
- Husband-wife	30.77	27.27	20.00	25.00	27.27
- Wife	23.08	18.18	-	-	15.15
- Husband-wife-children	7.69	18.18	20.00	-	12.13
Percent buyers loyal to a particular brand	76.92	63.64	60.00	75.00	69.70
Percent consumers-buyers sticking to the same brand consequent to rise in price	76.92	90.90	40.00	50.00	72.73
Percent buyers likely to shift another brand consequent to rise in price	23.08	9.09	60.00	50.00	27.27
Percent squash buyers likely to increase their consumption consequent to decline in price	7.69	-	20.00	-	6.06
Percent consumer buyers trying a new brand if introduced	46.15	63.64	60.00	50.00	54.55

brands of murabba were consumed by the consumer-buyers of murabba viz., beads and

unbranded.

It was found that 58.82%

sample buyers purchased murabba in retail, while only 41.18% purchased in wholesale. It was

Table 9. Ranking of Attributes-mix for Preferring a Particular Brand of Squash

Attributes mix	Percent positive response	Relevant classes with percentages of consumer-buyers with positive responses
Taste/flavour	33.33	Temporary service (60), business (38.46), regular service (27.27).
Fragrance, taste and quality	24.24	Regular service (27.27), farming (25.00), business (23.08), temporary service (20)
Price, taste and availability	18.18	Regular service (36.36), farming (25) business class (7.69)
Colour, quality and availability	15.15	Farming (50), temporary service (20) business class (15.38)
Price, taste and fragrance	9.09	Business (15.38), regular service (9.09)

reported 35.29% would increase their consumption of murabba in

Understanding consumer needs and buying process is essential in building effective marketing strategies.

response to its price decrease. The packing of murabba in plastic jar was preferred by 58.82% of buyers, while 41.18% preferred loose packing for it.

Implications

Consumer markets and consumer buying behaviour are to be understood well before sound marketing plans can be developed. Understanding consumer needs

and buying process is essential in building effective marketing strategies. By understanding major influences on buying behaviour, marketers can design effective marketing programmes for their target markets. The marketer's job is to understand the buyer's behaviour at each stage and what influences are operating. This understanding allows the marketer to develop an effective and efficient marketing program for the target market.

The related processed products viz; jam, pickle, sauce, squash and murabba were consumed mainly in the business and regular service classes. Other market segments were not effectively approached. The level of consumption of processed fruits and vegetables was very low, implying thereby a vast potential for expansion.

Marketeers/processors are expected to keep in mind the quality attributes and packing

material and size, while designing their products. The present findings have revealed explicitly

Marketeers/processors are expected to keep in mind the quality attributes and packing material and size, while designing their products.

what attributes in processed products were liked most in different market segments. Further, the absence of strong brand loyalty provided the opportunity to the existing and prospective processors/marketeers for penetrating into the market. □

HACCP Through ISO 9000 Quality Management System

SOHRAB

Quality Care,
2391, Pocket II, Sector D,
Vasant Kunj, New Delhi - 110 070

Introduction

In today's global market, quality and safety have become competitive edge for the enterprises producing goods and providing services. With the advent of ISO 9000 series of standards, the concept of quality has taken a tangible form. These standards have made a dramatic impact on business around the world. For the first time, there is a broad consensus about quality system's minimum requirements. This is the reason why ISO 9000 has unanimously received a world wide acceptance. This presents a good opportunity for the food industry for upgrading quality and bringing uniformity and consistency in their supplies to international market.

The food industry plays an important role in the national economy. It has a major share in India's exports. Since the international market has become demanding in terms of quality, safety and delivery, installation of quality systems and Hazard Analysis Critical Control Points (HACCP) in food industry would provide a competitive edge to food supplies in the international market.

The Quality System Standards seek to accomplish the following three objectives with regard to quality :

a) The enterprise should

achieve and sustain the quality of the product or service produced so as to meet contractually the purchaser's stated or implied needs.

b) The enterprise should provide confidence to its own management that the intended quality is being achieved and maintained.

c) The enterprise should instil confidence in the purchaser that the intended quality is being or will be achieved in the delivered

HACCP system, a well established concept in food safety, identifies specific hazards and provides preventive measures for their control to ensure the safety of food.

product or service provided. When contractually required, this provision of confidence may involve agreed demonstration of requirements.

Similarly, HACCP system, a well established concept in food safety, identifies specific hazards

and provides preventive measures for their control to ensure the safety of food. The application of HACCP is compatible with the implementation of ISO 9000 and is the system of choice in the management of food safety. The pace of progress of HACCP has been accelerated dramatically mainly due to the following two reasons :

a) Many hitherto unrecognized microbial foodborne hazards have come to light since 1960's,

b) The rapidly increasing global sourcing of raw materials and distribution of finished products make it imperative that governments cooperate at the international level to provide assurance of food safety.

HACCP is a tool to assess hazards and establish control systems that focus on preventive measures rather than relying mainly on end-product testing. It is now widely embraced by the food industries and by the government regulatory agencies around the world as a most cost-effective means of minimizing the occurrence of identifiable foodborne biological, chemical and physical hazards and maximizing product safety. It is a system, which targets critical areas of processing and in doing so, reduces the risk of manufacturing and selling unsafe products.

HACCP can be applied

* Chief Executive

throughout the food chain from the primary producer to final consumer. It enhances food safety and other benefits include better use of resources and more timely response to problems. In addition, the application of HACCP systems can aid inspection by regulatory authorities and promote international trade by increasing confidence in food safety. The successful application of HACCP requires the full commitment and involvement of management and the work force as in case of ISO 9000. The HACCP approach adds value to ISO 9000 Quality Management System and a combined effect would be a safe and wholesome food to consumers.

Principles of Hazard Analysis Critical Control Points (HACCP)

The HACCP system consists of seven principles. It is a system, which identifies specific hazards(s) and preventive measures for their control. These principles outline how to establish, implement and maintain HACCP system.

Principle 1

Identify the potential hazard(s) associated with food production at all stages, from growth, processing, manufacture and distribution of occurrence of the hazard(s) and identify the preventative measures for their control.

Principle 2

Determine the points/procedures/operational steps that can be controlled to eliminate the hazard(s) or minimize its likelihood of occurrence (Critical Control Point [CCP]). A "step" means any stage in food production and/or manufacture including raw materials, their receipt, harvesting, transport, formulation, processing, storage, etc.

Principle 3

Establish critical limit(s), which must be met to ensure the CCP is under control.

Principle 4

Establish a system to monitor control of the CCP by scheduled testing or observations.

Principle 5

Establish the corrective action to be taken, when monitoring indicates that a particular CCP is

HACCP is a tool to assess hazards and establish control systems that focus on preventive measures rather than relying mainly on end-product testing.

under control.

Principle 6

Establish procedures for verification, including supplementary tests and procedures to conform that the HACCP system is working effectively.

Principle 7

Establish documentation concerning all procedures and records appropriate to these and their application.

These principles are closely related to the 20 elements of ISO 9000 (Fig 1.). This shows how the two systems could be intertwined to be more effective.

Application of The Principles of HACCP

When conducting the

hazard analysis, consideration must be given to the impact of raw materials, ingredients, manufacturing practices, role of manufacturing processes to control hazards, likely end-use of the product, consumer populations at risk and epidemiological evidence relative to food safety. The intent of the HACCP system is to focus control at CCPs. HACCP should be applied to each specific operation separately. For identification of CCPs, all aspects of food chain need to be examined. The HACCP application should be reviewed and necessary changes made, when any modification is made in the product, process, or any step. It is important, when applying HACCP to be flexible given the context of the application.

Steps involved in implementation of HACCP: The implementation of HACCP principles requires the following tasks as identified in Fig. 2.

The HACCP is carried out by people. If the people are not properly trained and experienced, then the HACCP system is likely to be ineffective. It should be a multidisciplinary team that has specific knowledge and expertise appropriate to the product for example ; agronomists or veterinarians, production personnel, microbiologists, medical experts, public health specialists, food technologists, chemists and engineers according to the particular study. Where such expertise is not available on site, expert advice should be obtained from other sources.

Describe the Product and Its Intended Use

It should be noted what the product actually is and how/by whom it will be used. A full description of the product should be drawn up, including information on composition and method of distribution. The intended use should be based on the expected uses of the product by the end user or consumer. In specific cases, vul-

nerable groups of the population, for example; institutional feeding, may have to be considered.

Construct A Process Flow Diagram

The process flow diagram is used as the basis of the hazard analysis and should, therefore, contain sufficient technical detail for the study to progress. It should be constructed by the HACCP team. Each step within the specified area of operation should be analyzed for the particular part of the operation under consideration to produce the flow diagram. When applying HACCP to a given operation, consideration should be given to steps preceding and following the specified operation. When the process flow diagram is complete, it should be verified by the HACCP team. It should confirm the processing operation against the flow diagram during all stages and hours of operation and amend the flow diagram where appropriate.

Identify All Hazards

When the process flow diagram is completed and verified, the HACCP team should list all the biological, chemical and physical hazards (Principle 1), that may be reasonably expected to occur at each step and describe the preventive measures that can be used to control these hazards. For inclusion in the list, hazards must be of a nature such that their elimination or reduction to acceptable levels is essential to the production of a safe food. The team must then consider what preventive measures, if any, exist that can be applied for each hazard. Preventive measures are those actions and activities that are required to eliminate hazards or reduce their impact or occurrence to acceptable levels. More than one preventive measure may be required to control a specific hazard(s) and more than one hazard may be controlled by a specified preventive measure.

Identify the Critical Control Points

A critical control point is a point/step/procedure where a food safety hazard can be prevented, eliminated or reduced to an acceptable levels. The identification of a CCP (Principle 2) in the HACCP system is facilitated by the application of a decision tree (Fig 3). All hazards that may be reasonably expected to occur, or be introduced at each step, should be considered. Training in the application of the decision tree may be required. If a hazard has been identified at a step where control is necessary for safety, and no preventative measure exists at that step, or any other, then the product or process should be modified at

A critical control point is a point/step/procedure where a food safety hazard can be prevented, eliminated or reduced to an acceptable levels.

that step, or at any earlier or later stage, to include a preventive measure. Application of the decision tree determines whether the step is a CCP for the identified hazard. Application of the decision tree should be flexible, whether the operation is for production, processing, storage, distribution or other.

Establish Critical Limits for Each CCP

Since the critical control point (Principle 3) defines the boundaries between safe and unsafe products, it is vital that they are set at the correct level for each criterion. The HACCP team

should, therefore, fully understand the criteria governing safety at each CCP in order to set the appropriate critical limits. Critical limits must be specified for each preventive measure. In some cases, more than one critical limit will be elaborated at a particular step. Criteria often used include measurements of temperature, time, moisture level, pH, and available chlorine, and sensory parameters such as visual appearance and texture.

Establish A Monitoring System for Each CCP

Monitoring is one of the most important aspects of any HACCP system. It is the scheduled measurement or observation of a CCP relative to its critical limits. The monitoring procedures must be able to detect loss of control at the CCP (Principle 4). Further, monitoring should ideally provide this information in item for corrective action to be taken to regain control of the process, if there is a need to reject the product. Data derived from monitoring must be evaluated by a designated person with knowledge and authority to carry out corrective actions when indicated. If monitoring is not continuous, then the amount or frequency of monitoring must be sufficient to guarantee that the CCP is in control. Most monitoring procedures for CCPs will need to be done rapidly because they related to on-line processes and there will not be time for lengthy analytical testing. Physical and chemical measurements are often preferred to microbiological testing because they may be done rapidly and can often indicate the microbiological control of the product. All records and documents associated with monitoring CCPs must be signed by the person(s) doing the monitoring and by a responsible reviewing official(s) of the company.

Establish Corrective Actions

Specific corrective actions (Principle 5) must be developed for each CCP in the HACCP system in order to deal with deviations, when they occur. The actions must ensure that the CCP has been brought under control. Actions taken must also include proper disposition of the affected product. Deviation and product disposition procedures must be documented in the HACCP record keeping. Corrective action should also occur, when monitoring results indicate a trend towards loss of control at a CCP. Action should be taken to bring the process back into control before the deviation leads to a safety hazard.

Establish Verification Procedures

The HACCP system should include verification procedures (Principle 6) to provide assurance that HACCP system is being com-

Physical and chemical measurements are often preferred to microbiological testing because they may be done rapidly and can often indicate the microbiological control of the product.

plied with on day-today basis. This can be done most effectively by using audit method. Establish procedures for verification that the HACCP system is working correctly. Monitoring and auditing methods, procedures and tests, including random sampling and

analysis, can be used to determine if the HACCP system is working correctly. The frequency of verification should be sufficient to

Monitoring and auditing methods, procedures and tests, including random sampling and analysis, can be used to determine if the HACCP system is working correctly.

validate the HACCP system. Examples of verification activities include :

- * Review of the HACCP system and its records.
- * Review of deviations and product dispositions.
- * Operations to determine if CCPs are under control.
- * Validation of established critical limits.

Establish Record Keeping and Documentation

Efficient and accurate record keeping (Principle 7) is essential to the application of a HACCP system. Records need to be kept of all areas, which are critical to product safety as written evidence that the HACCP system is in compliance with the documented system. Documentation of HACCP procedures at all steps should be included and assembled in a manual. Records are useful in providing a basis for analysis of trends as well as for internal investigation of any food safety incidents, which may occur.

It is extremely useful to allocate a unique reference number to each HACCP record. The types of records that might be retained are as follows :

- * HACCP plan
- * Amendment to HACCP plan,
- * CCP monitoring records
- * Hold/trace/recall records
- * Training records
- * Audit records
- * Meeting records
- * HACCP systems procedures.

HACCP Through ISO 9000

ISO 9000 encompasses all of the activities of a company to ensure that it meets its quality objectives and HACCP system is directed towards ensuring safety of food. ISO 9000 and HACCP, concerned with quality and food safety management system respectively, have much in common. In fact, quality in broader sense includes safety. Therefore, the best way is to use ISO 9000 route to manage HACCP to ensure quality and safety of food. Both the systems are quality assurance sys-

ISO 9000 encompasses all of the activities of a company to ensure that it meets its quality objectives and HACCP system is directed towards ensuring safety of food.

tems, designed to provide maximum confidence that a specified acceptable level of quality and safety are being achieved at an economic cost.

The seven principles of HACCP (Principle 7) and 20 elements of 9000, the most comprehensive model, are closely



Fig 1. Elements of ISO 9000 Quality Management System

Fig 2. Logic Sequence for Application of HACCP

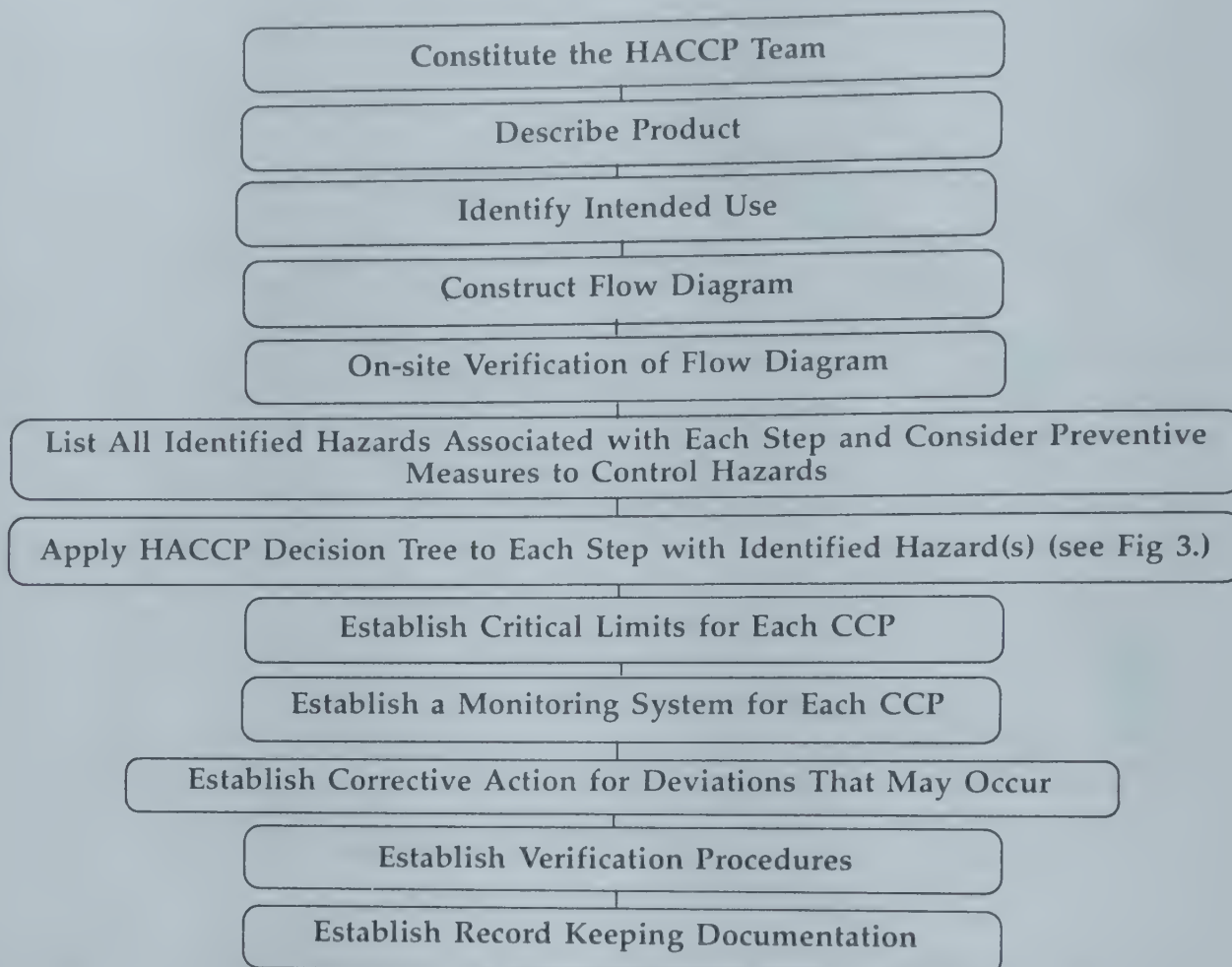


Fig 3. HACCP Decision Tree to Each Step with Identified Hazards

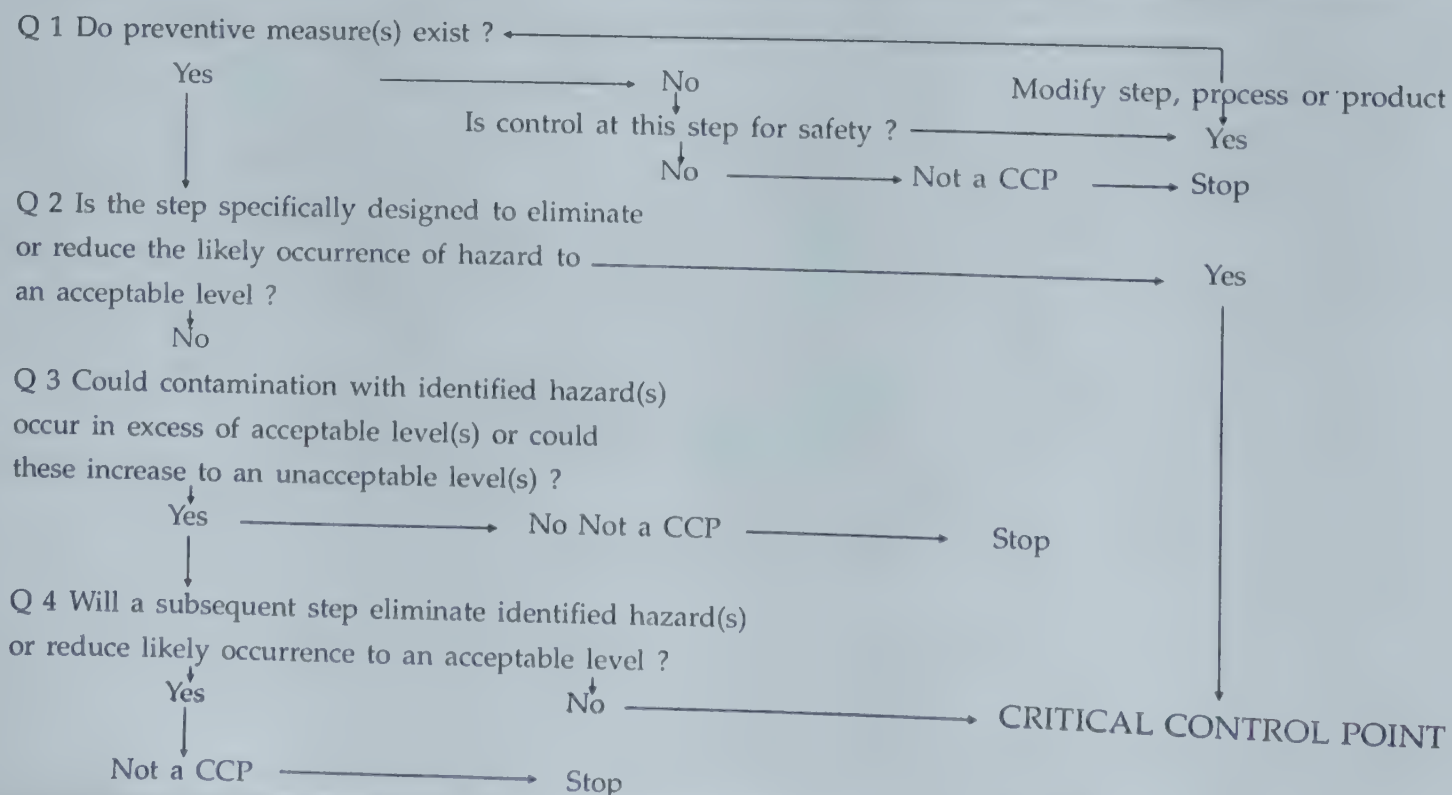


Table 1 :ISO 9000 and Its Application to HACCP

ISO 9000 Clauses	HACCP Application
4.1 Management responsibility	- Quality policy may include HACCP and demonstrate management commitment. - Responsibility and authority for HACCP must be defined - Management review for ISO 9000 should include review of effectiveness of HACCP operation
4.2 Quality system	- HACCP specifically considers all activities which could have an impact on the safety of the product and ensures that they are consistently documented, a quality product is also a safe product.
4.3 Contract review	- Like ISO 9000, it considers the relationship between the customer and supplier to meet the requirements. Some raw materials may be CCP and it will be essential to have tight control over their supply.
4.4 Design control	HACCP process starts at the product concept stage, i.e. the design and control through a Quality Management System. Design control must include HACCP at the concept stage - has it been designed safely ?
4.5 Document control	Like ISO 9000, HACCP documents including HACCP plan, artwork for packaging need to be controlled and authorized. This will prevent the use of obsolete documents. Use of uncontrolled copies should be avoided. Each HACCP document should bear a unique reference number for cross-referencing with CCP.
4.6 Purchasing	Everything purchased from raw material to sub-contracted items should be clearly specified through written specifications. Control of sub-contractors should be through assessment and records kept. This will include calibration, process equipment servicing, hygiene and pest control.

Table cont'd

- | | | |
|------|---|--|
| 4.7 | Customer-supplied | It is essential to ensure that ingredients and packing material when supplied by customer are included in the HACCP assessment. |
| 4.8 | Product identification and traceability | <p>HACCP system requires traceability of batches of raw material to final products in the event of a failure at a CCP.</p> <p>A documented recall plan should be maintained for being able to trace and withdraw any defective product.</p> |
| 4.9 | Process control | <p>HACCP includes the following key areas at all stages in the process :</p> <ul style="list-style-type: none"> i) Building - all facilities from raw material storage areas, through process and dispatch, including employee amenities. ii) Plant and equipment - process capability, preventive maintenance, hygienic design and cleaning. iii) Personnel - training, health screening, meeting legislation iv) Cross-contamination - at all stages where this could be a risk. v) Waste materials - clearly identified and segregated. vi) Computer failure - contingency plans should be in place. vii) Environmental control - atmosphere, ground water.. |
| 4.10 | Inspection and testing | <p>Where raw materials are CCPs, these should not be used until confirmation of conformity has been received.</p> <p>Materials used before being certified as meeting specifications should be traceable in order to allow a recall at a later stage, if necessary.</p> <p>Finished products should be held until confirmation of all CCPs having been met in full has been received.</p> <p>Records of all inspection and test results should be maintained.</p> <p>Personnel carrying out testing should be trained as being capable for the job.</p> |

Table cont'd

4.11 Inspection measuring	All equipment needed to monitor a CCP should be of known accuracy and precision and calibrated on a regular basis and status marked. Equipment must be maintained and stored correctly inbetween calibration in order to avoid damage. Records of calibrations should be kept
4.12 Inspection and test status	There should be a clearly defined method for identification of the inspection and test status of any raw material, product, or equipment to prevent its being used inadvertently.
4.13 Control of non-conforming product	HACCP should define as to who is responsible for taking corrective action in the event of a deviation. This must include, what to do with product made, while the system was out of control, i.e., to rework, recycle to reject. Procedures must be developed to ensure that all non-conformities at a CCP are recorded. This will enable trends to be analyzed.
4.14 Corrective action	If a CCP is out of control, the underlying cause must be identified in order for the problem to be permanently resolved and not repeated. Corrective actions also include pest control audits and hygiene audits. The effectiveness of any corrective action must be verified for confirmation. All corrective action must be recorded.
4.15 Handling, storage, packaging and delivery	Hazards may arise from improper handling and storage of a product or raw material or use of unsuitable packaging material - unable to withstand distribution. Areas for consideration include : - food contact packaging - control of artwork - storage and distribution temperatures - stock rotation - shelf-life - contamination risks - environment conditions - hygiene and pest control

Table cont'd

4.16 Quality records

HACCP records affecting safety should be controlled and retained for a specified period based on statutory regulations and product shelf-life as demonstration of the effective management of food safety.

4.17 Internal Quality

HACCP system should be a part of internal audit system and audited regularly by members of the HACCP team or internal auditors for its continued suitability and effectiveness paving the way for continued improvement of the HACCP system. Process flow diagrams must be audited as part of the verification.

4.18 Training

HACCP relies on the participation of knowledgeable and trained people across a wide range of disciplines. Areas training should reflect system changes, emerging food safety issues, new processes and corrective action skills. Training records should be available for all staff and include all types of training - in-house, external, skills or awareness activities.

4.19 Servicing

This is not normally applicable. But suppliers of vending equipment may require servicing of such equipment to be documented and controlled, as such equipment can be a source of hazards, if not cleaned and maintained correctly.

4.20 Statistical sampling

For HACCP control sampling regimes at each CCP needs to be documented. Statistical sampling plan may be used. Decisions of conformity should be based upon results of sampling and testing. Statistical techniques may also include process capability assessment and statistical process control during CCP monitoring.

related (Fig 1). Both require documented procedures for their operation. The ISO 9000 requires all activities affecting quality to be documented. If HACCP requirements are intertwined with ISO 9000 documented system, it would be the most cost-effective and efficient system to manage both quality and safety. A more detailed comparison of HACCP and ISO 9000 is given in Table 1.

Conclusions

It may be seen how the two systems-ISO 9000 and HACCP- are vital for management of quality and safety of food to assure customers around the world. The regulatory agencies lay more emphasis on safety, while businesses emphasize on both quality and safety as a component of reliable quality. HACCP adds reliability to quality i.e., food is not only good at the point of manufacture but

also through its shelf life period.

It is logical to select ISO 9000 route to implement HACCP, as it is a well known widely practised system around the world with over 150 000 companies already certified. It would be much easier to induct HACCP in an already operating ISO 9000 system with a little tailoring.

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1. Freezing equipment can be used for continuous concentration of juices such as Orange, Apple, Lemon & cane.
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Road, Rajkot - 360 002. Gujarat

Chlorine (Hypochlorite Solution) Generator

Titanium Tantalus Products Ltd has introduced what is called "The Hypogen" is an on-site hypochlorite generator system provided with monopolar or bipolar cells. A cost-effective and user-friendly system for applications, where chlorine is required in the form of hypochlorite solution, the products are easy and safe to handle, because there is no free gaseous chlorine. The generator helps do away with stocking of liquid chlorine cylinders or bleaching powder. It can be switched on, whenever required. The system uses sea water or synthetic brine solution containing 20- 30 gpl and AC power supply. Packaged and skidmounted units for 25-1200 gm available chlorine/hr as hypochlorite solution (chlorine content 0.1-5 gpl) are available in five models. Units can be custom-designed for any particular application. The units find applications in industrial process water disinfection; disinfection of swimming pools; biocide for open recirculation cooling tower systems, sterilisation in the food, brewery, poultry and fishing industry; treatment of industrial effluents; and drinking water supplies.

For more details write to :
Titanium Tantalus Products Ltd
86/1, Vengaivasal Main Road,
Gowrivakkam Post
Chennai - 601 302

Fermentation Systems

Navin Process Systems offers complete integrated pilot plant and medium size commercial fer-

mentation system on a turnkey basis. The range of sizes covered is from 20 to 20,000 litres. Material of construction used is stainless steel (grade 304/304L/ 316/316L or as per application). The fermenters consist of a top-driven agitation system with geared AC motor, variable speed drive, single dry running mechanical seal, flat/inclined/curved blade turbine impellers, bottom bush support and removable baffles. Appropriate heating/cooling device is selected from among baffled jackets or internal/limpet coils as per application. Complete skid mounted piping assembly is provided for operating the fermenter. The programmable controller (PLC) based process control instrumentation supplied consists of measurement and control loops for temperature, air flow, back pressure, agitator speed, pH, dissolved oxygen, exhaust gases and foam. Field instruments required are selected on the basis of accuracy of response to input/output signal, reliability, durability and capability of withstanding harsh industrial environments. A PC-based SCADA software custom-designed for fermentation processes forms part of the package. Services provided include system design as per application, installation and commissioning of the system at the customer's site. Three sterility runs are undertaken for the purpose of establishing sterility of the system as well as for training of the operating personnel. Care is taken at all stages of manufacturing to ensure that the system is suitable for carrying out sterile operations. To date, fermentation systems have been designed and supplied for a wide variety of applications such as antibiotics, vitamins, vaccines, animal cell cultures and steroids.

For further information write to :
Nevin Process Systems
25/148 Pradhikaran, Nigadi,
Pune - 411 044.
Maharashtra.

Portable Laboratory Viscometers

Cole Parmer Instrument Company offers portable laboratory viscometers designed for measuring the viscosity of Newtonian and non-Newtonian fluids. The viscometer requires only 1 ml of sample and is equipped to measure a range for 0.5 to 20,000 centipoise. A built-in resistance heater controls temperature from 10 above ambient to 100°C with + 0.15°C accuracy. Each viscometer comes equipped with three vials of calibration fluid, four measurement pistons, a protective cover, and a 7-1/2 ft power cord.

For further information write to :
Cole Parmer Instrument Co
625 E. Bunker Court, Vernon
Hills, IL - 60061, USA.

Water Testing System for On-Site Analysis of Water

In the industry, in order to avoid scaling or corrosion in boiler and to ensure that the effluent being let out of factory is meeting the specifications, quality of water from source and from effluent treatment system has to be checked regularly for parameters such as water hardness, alkalinity, chlorides, silica, pH, TDS and temperature. For quick and on-site analysis of water, Prerana Laboratories has developed a water testing system containing test packs and instruments. All these test packs and instruments have been packed in specially made handy carry case for on-site

use. The test kits included in the system are water hardness, alkalinity, chlorides, silica, calcium, phosphates along with instruments like pH meter, TDS meter and thermometer. As one can do the testing at site itself with the help of system, he saves lot of item, cost and hassles of sending the sample to distant laboratory, even his own and waiting for the results. The system finds application in industries such as chemical, sugar, textile and paper. Separate test packs for individual parameters are also available.

For more details write to :
Prerana Laboratories
C/17 Meghali, Orion Complex,
Opp Ganesh Mandir
Aundh Road, Khadki, Pune - 411
003, Maharashtra.

Drying Equipment for Vacuum Applications

Reading Technologies offers multi-stage filtration and drying equipment for vacuum applications. They help to protect vacuum pumps from the damaging effects of particulate matter and water vapour on the inlet side of the pump. It also helps reduce oil vapour migration out of the pump from the exhaust side. The filters and dryers help to protect and extend the life of vacuum pumps as well as ensure the uninterrupted operation of equipment that depends on vacuum. The desiccant stages help ensure that water vapour does not contaminate pump oil. Applications include vacuum furnaces, packaging equipment, biomedical equipment and food packaging systems.

For further information
Reading Technologies Inc

1031F MacArthur Rd, Reading,
PA 19605, U.S.A.

Continuous Cooker for Candy

Dhiman offers a continuous batch vacuum cooker specially suited for the production of high boiled sugar sweets. The material is dissolved in a tank and after filtration, it is pumped into the continuous cooker. In the cooker, the predissolved material is cooked and then the batch is vacuumed continuously. The capacity of the cooker is approx 750 kg/hour. The batch is ready in 5 to 7 minutes. Two pans can be rotated and the size of the batch can be adjusted as per requirement. The batch made with a continuous cooker is uniform. As the syrup is made once and there is no variation in proportion of material. As cooking and vacuuming too are a continuous process, it gives better finish and longer shelf life to the product. The fuel consumption is 1/3rd as compared to batch cookers for the same quantity of production.

For further information write to :
Dhiman Systems (India) Ltd
Dhiman Group Complex
Kapurthala Road, Nakodar - 141
310, Punjab.

Water Purifier

Singer (India) Ltd has launched a multi-stage water purifier, Aquarius II. The Delhi-based company had earlier launched Aquarius, which has been phased out. That happened because the new product uses far superior technology.

Aquarius II, based on Resin technology, has been launched in the four metros and Bangalore, keeping in mind A1, A2, B1 and B2 households. SIL hopes to take Aquarius II national by the end of this year.

Water passing through Aquarius II gets disinfected in four stages, unlike its predecessor, which used nine stages. The water enters from the top into the first dome (there are two of these), where a filter traps dust particles and scales. It then moves to the second dome, the top portion of which clears the water of excess chlorine, lead and copper by oxidization. The middle portion, where the much-touted Resin technology comes into play, makes the water microbe-safe and the last stage rids the water of any foul odour, taste or colour.

The company estimates the market for water purifiers to be around 1.5 lakh units and hopes to sell 12,000 units of Aquarius II in the first year. The purifier will be sold door to door, and through demonstrations at leading supermarkets and exhibitions. It will also be made available at all Singer centres.

PET Packaging for Food Industry

Ultra Pac, Inc manufactures clear "PET packaging" for the food industry. Ideal for bakeries, supermarkets and food processors, this packaging will not crack or break and is of superior clarity. The clam-shells are ideal for frozen applications. According to the manufacturer, these products offer high quality at competitive prices and are environmentally friendly.

For further information : Contact
Cal Krupa, CEO, ultra Pac, Inc.,
Dept, CN, 21925 Industrial Blvd,
Rogers, Minnesota 55374 USA.
Telephone : 612- 428-8340 Fax :
612-428-2754 Email :
upac@ultrapac.com.

Innovative Packaging Machines

The Thane-based Venus Packaging Services, which has developed many unique import substitute packaging machines, has recently designed a rinse-fill-seal machine for mineral water in PVC/PET bottles of 500-1,500 ml. The machine got the award of 'Most Innovative Design of the Year '94' from the Indian Institute of Packaging.

Venus currently offers three models of the rinse-fill machines, with output capacities of 15, 24 and 60 BPM (l litre), while 120 BPM model is under development.

Another product from Venus is the triple cavity double action punching press for short skirt crown caps, which is a fully automatic press right from accepting pre-cut sheets from a stack to stacking the punched sheets. Besides, the company has also developed a fully automatic PVC lining machine for crown caps with molded profile linings, which is a compact monoblock machine with built-in heaters. Its other product, the single web standipouch machine, takes 3" x 3" to 8" x 12" standipouch sizes.

For further information write to : Venus Packaging Services, 302 Palm Beach, Versova, Mumbai - 400 061. Tel : 632 139/98, Fax : 91-22-626 4835.

NEW PRODUCTS

Instant Coffee Mix

Bangalore-based consolidated Coffee Ltd (Conscofe), a subsidiary of Tata Tea Ltd, has just marked its presence in the only segment of coffee by launching a new Instant Coffee Mix Tata Kaapi in cities of Tamil Nadu.

Priced at Rs 28.50 for a 50-gm pack, Tata Kaapi is a mixed instant coffee launched in direct competition to Brooke Bond Lipton's category leader Bru and Nestle's Sunrise. The other brand in this segment is Tripti, a 60:40 blend. Tata Kaapi is also available in a pack size of 200 gm (Rs. 105) and a sachet of 18 gm (Rs. 10).

The company has also launched what it calls a paisa pack with a 'five-four-three' formula. It's a five-gm pack which makes four cups of coffee and is priced at Rs. 3. This has been specifically designed for the rural market, which the company hopes to penetrate in much the same way as shampoo and *pan masala* brands have done with sachets.

Tata Kaapi, like Bru and Sunrise, is a 70:30 mix of coffee and chicory. With this launch, Tata Tea becomes the only company in India to have a brand in each of the four segments of the coffee market. There's Coorg pure filter coffee, Double Roast mixed filter coffee, Tata Cafe pure instant coffee, and now Tata Kaapi - a mixed instant coffee.

The brand will be available in all the southern states first, and then taken national in a phased manner. While Bru enjoys leadership in the South (in the mixed instant segment), Sunrise dominates in Mumbai.

The brand name and packaging have been designed to be a 'scream'. Kaapi, in South India, very distinctly connotes coffee or a hot beverage.

Other small differences include putting the coffee-chicory blend story on the front panel of the pack (it is normally put at the back). This, says the company, is to avoid confusion in the consumer's mind that Tata Kaapi might be a brand of filter coffee.

The brand is targeted at house-holds earning more than Rs. 600 per month.

The mixed instant coffee market is estimated to be around 4,620 tonnes. The company has undertaken an extensive sampling drive whereby a three-gm pack of Tata Kaapi is being distributed free with Tata Press Yellow Pages in Tamil Nadu.

According to research done by the company, Tata Kaapi hopes to narrow the bridge between the tradition of filter coffee and the modernity of instant coffee.

Enriched Value-added Breakfast Cereals from Kellogg

Chocos-wheat scoops drenched in chocolate - was launched late last year, exactly two years after Kellogg entered the Indian market with a three-product hamper of staple breakfast cereals : corn, wheat and basmati flakes.

Frosties has arrived six months after Chocos in Bangalore and Hyderabad, besides the four

metros. The value-addition in it, which takes the form of sugar frosting on individual flakes, makes Frosties the most expensive Kellogg product in the Indian market (priced at Rs. 35 for a five-serving 150-gm pack and Rs. 55 for a five-serving 250 gm, compared to Rs. 40 for a 175-gm Chocos pack). That the price is too high is not a worry, says Avronsart, who, as with all his other products, is betting on Frosties' "high nutrition value". Frosties contains eight vitamins (adding upto 25 per cent of recommended dietary allowance or RDA), iron (15 per cent RDA) and zinc (10 per cent RDA).

Frosties targets children and teenagers in the 11-19 year age group. The 'grrreat' in the line is provided by Tony, the tiger that has been associated with the brand since 1952. Chocos uses a brown bear christened Choco. Tony will maintain a "friendly ongoing dialogue" with children at the back of every christened Choco. The launch pack carried 'personal jottings on his favourite cricket moments' from the 1996 Titan Cup finals.

Kellogg's previous four offerings lacked a sweetener, so Frosties should find more acceptance - by way of taste - at the Indian breakfast table. That is because Indians tend to boil milk, killing its intrinsic sweetness. Moreover, breakfast cereals become soggy in warm milk while sugar doesn't dissolve easily in cold milk. Americans, on the other hand, enjoy its crunchy taste in unboiled cold milk.

Dairy Whitener from Nestle

Nestle India Ltd. is trying to follow the same pincer strategy with its Nescafe and Nestle Sunrise - straddle the premium and the popular ends of the market. Already present at the premium end with Nestle Everyday, it has now launched Nestle Tea-Mate dairy powder, targeted at the price conscious consumer. Priced at Rs. 56 for 500 gm against Amulya's Rs. 62, Tea Mate hopes to seize share from existing lower end brands.

After covering the north-eastern states where whitener consumption is highest, the brand now plans to go national.

The company which has already launched a soft-centred sweet called Allen's Splash, intends launching as many as 27 products - including extensions and new pack sizes - in 1997. Allen's Soothers lozenges and Maggi tamarind sauce are rumoured to be next. Others will also be either confectionery or culinary products - the two identified thrust areas.

Oils and Oleoresins, Natural Food Colours, Floral Extracts and Resinoids

Synthite offers oils and oleoresins, natural food colours, floral extracts, resinoids, dry flowers, etc. Available are oleoresins, obtained by solvent extraction, from a wide range of spices. These serve as convenient substitutes for raw spices in food products. By careful selection of parameters, oleoresins can be produced to meet the exact cus-

tomers requirements. Essential oils are recovered from spices by steam distillation. Food colours, derived from natural sources, include annatto, marigold, paprika red sandalwood and turmeric and floral extracts include jasmine, tuberose and mimosa. Resinoid is made from Indian Olibanum and is used in perfumery. Also offered are a range of seasoning, including meat, poultry, seafood etc.

For more details write to :

Synthite Industrial Chemicals Ltd
Synthite Valley, Kadayirippu,
Kolencherry
Ernakulam, Kerala - 682 311.

Squeezed to Please!

Onjus is the product of Mumbai-based Enkay Texofood Industries Ltd. an exporter of tropical fruit juices and concentrates. The company claims to be the only Indian player in the category with an ISO 9002 certification.

Pepsi, Coca-Cola and Heinz are among its clients.

Onjus is Enkay's first consumer product for the domestic market and is presently available in Mumbai and Pune. It is priced at Rs. 9 for 250 ml and Rs. 35 for a one-litre tetrapak.

The company imports the oranges from different parts of America, while the Rs. 26-crore packaging equipment has been imported from Tetra Pak of Sweden.

Enkay says that the right flavour and colour for Onjus was arrived at after two years of research. It means to taste like fresh orange juice and has a shelf-life of six months. Even an open pack can be safely refrigerated for three-four days. Four thousand packs of Onjus are packed each hour in the company's manufacturing unit at Bhilad near Vapi (Gujarat).

The company insists that the product contains no preservatives and is unsweetened. In that regard it is different from Real fruit juices from Delhi-based Dabur which contain sugar. But Real, priced between Rs. 27.50 - Rs. 30 for 500 ml packs, has three flavours to offer - orange, pineapple and mango. Yet, Enkay feels it has an upper hand because Onjus is cheaper and comes in two pack sizes.

The domestic market being absolutely unfamiliar to Enkay, the company is aiming Onjus at everybody. The company, tries to sell at least 12,000 outlets in Mumbai alone. The advertising is being handled by Ambience, and ads will be seen in print and 'Squeezed to Please!' is the headline on its advertisement

Flavours, Fragrances and Aromatic Chemicals

BBA India, an associate of Bush Boake Allen Group, offers flavours, fragrances and aromatic chemicals. Offered are 100% natural flavours and flavours that combine natural and nature- identical ingredients or artificial flavours. Besides flavours such as pineapple, orange, vanilla, rose, mango and banana, the firm has developed tailor-made products like liquorice, guava, cola, almond milk, rose milk, tonovin, passion fruit and sarsaparilla.

For more details write to :

Bush Boake Allen (India) Limited
1-5, Seven Wells Street,
St Thomas Mount,
Chennai - 600 016.

Industrial Biocide

Merlin Laboratories has developed an industrial biocide called Meridol having wide bactericidal action both against gram negative and gram positive bacteria. It is used as an additive in water-soluble cutting oil emulsions. Retaining its bactericidal action for long, it prolongs emulsion life, and its antibacterial action maintains the machine-shop free from malodour. Meridol is effective even in adverse conditions such as highly contaminated water used for dilution.

For more details write to :

Merlin Laboratories
P O Box 2079, No 1, 1st Main
Road, Gandhi Nagar
Adyar, Chennai - 600 020.

Oleic Acid

Pasand offers oleic fatty acid for use in chemical industry. Oleic acid technical grade is produced by hydrolysis of fats of fixed oils and subsequent separation of the liquid fatty acid. It is clear and free from sediment, suspended and other foreign matters. Oleic acid is used in the manufacture of various products, such as lubricants, carbon paper, stencil paper, paints, liquid soap, disinfectants, textile finishing preparation, printing inks, metal polish, flotation

process, etc. The company manufactures two types of oleic fatty acid - low titre grade (LT) and high titre grade (HT). Low titre grade has low titre value, available in technical grade. Its unsaturated fatty acid is 90% and oleic acid oil C 18:1 is more than 55%. Because of low titre value it is always in a liquid form at room temperature and emulsifying easily. This unique fatty acid is triple bond linolenic, more than 10%. In high titre grade (Indolic), unsaturated fatty acid is 80% and saturated fatty acid is 20%. It is light in colour, oleic acid C 18:1 is more than 45% and polyunsaturated linoleic double bond is 35%.

For more details to :

Pasand Soap & Chemical
Industries
37, Karanpara, Opp. Hotel
Samrat, Rajkot - 360 001
Gujarat

Industrial Detergents/ Degreasers

Swastik Surfactants' Idet 10 (powder) and Idet-5L (liquid) are industrial detergents/wetting agents based on anionic surfactants, used in textile wet processes, pesticide WDP formulations and general washing and cleaning operations. The Earthshield industrial degreaser/cleaner (liquid) is an industrial metal degreaser,

based on non-ionic surfactants. It is used in degreasing/cleaning metal components and machinery parts and in maintenance cleaning. The exclusive product is biodegradable, non-inflammable, non-toxic, eco-friendly and water-soluble.

For more details write to :

Swastik Surfactants Ltd.
442, Appa Saheb Marathe Marg,
"Industry Manor" 1st Floor,
Prabhadevi, Mumbai - 400 025

Microcrystalline Cellulose Powder

N. B. Entrepreneurs manufactures Microcrystalline Cellulose Powder (Sancel) for use in pharmaceutical industry. Sancel is purified, partially depolymerised alpha, cellulose. It is white, odourless, tasteless, and free from organic and inorganic contaminations. Insoluble in water, dilute acids, and almost all organic solvents, it is practically insoluble in sodium hydroxide solution.

For more details write to :

N. B. Entrepreneurs
Uppalwadi, Kamptee Road, Near
Industrial Estate
Nagpur - 440 026
Maharashtra

RESEARCH ROUND-UP

Safe Herbicide

A naturally developed safe herbicide that could be used by farmers without injuring insects, animals or humans is being developed by biologists at Edinburgh University.

Belonging to the B complex of water-soluble vitamins essential for healthy growth, biotin is used by the human body to release energy from fat and carbohydrates. Although its deficiency in humans is unknown, biotin is invariably added to vitamin supplements. Produced by plants and micro-organisms for growth, it can also be manufactured synthetically, but at considerable cost.

Dr Bob Baxter and his team at Edinburgh have embarked on further studies to try and produce large quantities of the vitamin using natural methods. Dr Baxter said that understanding the natural process of how biotin is made by plants opens the door to developing substances what will block its production. By developing a herbicide to inhibit the growth of biotin, all types of weeds could be eliminated. It would also allow herbicides to be designed which target plants but leave non-biotin producing organisms, animals, insects and humans completely unaffected.

Dr Baxter predicts a future in which farmers will treat land with only a couple of grams of herbicide instead of the large quantities that are used today. The herbicide would be entirely environmentally friendly, causing no problems to humans or wild life.

The Edinburgh team has been working on the project for five years and hopes to ultimately produce an inhibiting herbicide

simply and cheaply. With a new three year grant to continue the studies Dr Baxter and his team are considered world leaders in the research which could lead to a profitable biotechnology company being established in Scotland.

For further information contact :

Dr Bob Baxter, Department of Biological Chemistry,
Edinburgh University,
7 George Square,
Edinburgh, Scotland E H8 8G7.
Tel : +44 131 650 3440;
Fax +44 131 650 3461.

A Novel Protein-extraction Method

A new way of separating and purifying protein pharmaceuticals has been developed in the United Kingdom by Cambridge University and Affinity Technology Limited.

The technology allows highly purified proteins to be extracted from cells and other biological sources more cheaply and easily. This represents a significant advance in the protein such as interferon, insulin and factor 8.

Proteins used in human health care need to be extracted from complex mixtures and highly purified before use, traditionally a lengthy and costly procedure.

The new method allows scientists to separate a particular protein from other compounds using custom-designed compounds which, following immobilization to solid support particles, bind the protein of interest and allow impurities to pass unhindered.

The new adsorbents, sold under the Mimetic trade mark, are very stable, easy to sterilize and much less expensive than materials previously used to purify drug proteins. Their high selectivity minimizes the number of processing steps required to manufacture high-purity proteins and can result in significant cost savings for manufacturers. The new media are so effective that they have been incorporated into some of the world's largest biotechnology manufacturing projects.

In 1996, the university's Institute of Biotechnology and Affinity Chromatography jointly won a prestigious Queen's Award for Technological Achievement for the discovery. Affinity Chromatography, a spin-off company from the Institute of Biotechnology, manufactures bulk quantities of product in clean-room production facilities at its plant on the Isle of Man.

For further information contact :

Dr Chris Lowe,
Institute of Biotechnology,
University of Cambridge,
Tennis Court Road,
Cambridge, United Kingdom,
CB2 1QT, Tel : +44 12233 334160
Fax :+44 1223 334162.

Geraniol-rich Citronella Strain

Geraniol (C₁₀ H₁₈ O), an unsaturated primary terpene alcohol, is highly valued in perfumery and as a base for a large number of semi-synthetic aroma chemicals. Its major source is palmarosa (*Cymbopogon martinii*). Although

palmarosa profitably grows in tropics, its cultivation in sub-tropics, especially in foot hill areas of Uttar Pradesh has not been economic. In view of this, the Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow, took up studies to find suitable substitute crop for palmarosa for production of geraniol in these areas. The CIMAP's Pantnagar Field Station has identified a spontaneous tall mutant of *Cymbopogon winterianus* Jowitt (Java citronella), which profusely grows in both tropical plains as well as sub-tropical foot hills and has greatly robust growth habit with the essential oil rich in geraniol (60%). Assessment of productivity in clone population of this geraniol-rich citronella (GRC) against two standard checks of palmarosa and jamrosa (Interspecific hybrid of *C. nardus* var. *confertiflorus* and *C. jawarancusa*), has shown improvement in GRC over the checks for the six promising characters studied. The increase in yield of geraniol in GRC over the two checks was about 50 and 56%, respectively. The yearly averages for per hectare geraniol yield in the three genotypes (GRC, palmarosa and jamrosa) were 150.7, 100.4 and 96.4 kg, respectively. While Java citronella is cultivated in the country for commercial production of citronellol and citronellal, development of its mutant chemovar GRC, would further boost its commercial cultivation for production of geraniol. It is envisaged that GRC would be a good substitute crop for palmarosa for the production of geraniol in foot hills of Uttar Pradesh. Olfactory evaluations are in progress that would fix the market value of the geraniol quality.

Breeding Fresh Water Prawn

The Fisheries College at Mangalore has achieved a break-

through in breeding of fresh-water prawn, *Macrobrachium Rosenbergii*, for the first time in Karnataka. The larvae of fresh-water prawn were successfully hatched and are being reared in the hatchery equipped with a self-designed and fabricated biological filter and air lift recirculatory system in the aquaculture laboratory.

Dr H. Shivananda Murthy, Associate Professor and principal investigator, conducted the research funded by the Indian Council of Agricultural Research, New Delhi.

It is proposed to standardize the hatchery technology suitable for agro-climatic conditions of the region under this research project. According to Dr S.L. Shanbhogue, Director of Instruction, Fisheries College, fresh-water prawn seed is badly needed by the local aqua farmers.

Salmonellae in Eggs

A study to determine the effects of infectious bursal disease (IBD) on egg contamination in White Leghorn hens infected with *Salmonella enteritidis* (SE) phage type eight was conducted by R.A. Phillips and H.M. Opitz, Dept. of Animal, Veterinary and Aquatic Sciences, University of Maine, Orono, Maine, U.S.A.

The IBD- and SE- infected hens were compared with SE- infected hens that were not IBD- infected.

Of 1,050 eggs cultured from the IBD+SE- infected hens, SE was cultured from 88 shells, five albumens, and two yolks. In contrast, of 1,258 eggs cultured from the group infected with SE alone, 33 shells were positive and none of the albumens or yolks was positive for SE. All eggs that had SE positive contents also had SE positive shells.

Results of this study also showed that SE can persist in the intestinal tract of orally-infected chicks from two day to 64 weeks of age, thus creating the potential for shell contamination, regardless of whether the chicks were IBD-infected.

Contaminated Fish May Lead to Male Infertility

Increased intake of fish from water reservoirs contaminated by industrial wastes and toxic materials can lead to infertility and various other ailments of the immune, nervous and endocrine systems, experts have warned.

According to the Inter-governmental Forum on Chemical Safety (IFCs) and Inter-Organisation Programme for the Sound Management of Chemicals (IOMC), the evidence of low sperm counts, increased cases of testicular and breast cancer, undescended testes and endometriosis caused by heightening concern about human health around the world.

The two organizations formed after the 1992 Earth Summit at Rio De Janeiro in Brazil have warned that humans are daily exposed to many synthetic compounds that even in small doses can disrupt development of reproductive, immune, nervous and endocrine systems.

According to Dr. Theo Colborn, Director of the Wildlife and Contaminants Programme of the World Wildlife Fund (WWF), adult human beings carry at least 500 measurable chemicals in their bodies that were never in anybody before the 1920s.

Food Wastes Can Feed Four Millions - An USDA Study

Americans routinely tossed away uneaten vegetables, day-old bread and other pantry items, wasting one-fourth of the nation's total food supply, according to the US Agriculture Department (USDA).

If just five per cent of the wasted food that was nutritious and safe was recovered from restaurants, grocery stores and pantry shelves, it could feed an estimated 4 million poor and homeless US citizens. "By recovering a fraction of this lost food, we could get food to those in need instead of tossing it into the dumpster," said the Agriculture Secretary, Mr. Dan Glickman, who released the study of a hunger relief conference in San Diego.

An estimated 96 million pounds of food - i.e., 27 per cent of the 356 billion pounds of edible food available in the US was wasted in 1995, according to the USDA study. The vast majority of

the waste came from consumers who threw away uneaten vegetables, forgot foods in the back of a refrigerator until they spoiled or discarded bread, milk and other dairy products more than a day or two old.

Many consumers also threw away foods because they had trouble interpreting package-dating information, such as "sell by" dates or respiration codes, the study said.

Smaller amounts of blemished food, perishable items and dented cans of food were discarded by grocery stores, restaurants and food processors and farmers. In 1995, more than 16,000 new food products landed on grocery store shelves and industry experts estimate that most products fail to catch on and are discarded by retailers.

According to Mr. Marc Cohen, a researcher with Bread for the World Institute, many fast food restaurants prepare hamburgers and if nobody eats them, they get tossed away because of strict quality standards.

Anti-hunger activists said that they would like to see more financial incentives created for res-

taurants, grocery stores and other business to donate food. The problem of wasted food at home could be addressed much like the USDA has promoted its 'food pyramid of nutrition' in public and private schools, Mr. Cohen said.

Mr. Glickman launched a food "gleaning" or recover programme last year to encourage federal agencies, private cafeterias and others to donate leftover food to local soup kitchens and food banks.

Last year, the US Congress also tried to encourage more donations by adopting a "Good Samaritan" law that would limit the legal liability if someone were to become ill from eating donated foods.

In addition to feeding the hungry, recovering more of the nation's wasted food would cut down on the volume of material going into garbage landfills, saving tens of millions of dollars in solid waste costs, Mr. Glickman said.

The USDA, which also runs the nation's food stamp programme, spent almost \$38 billions last year to provide food aid to 45 million hungry Americans. (For details see Data Bank).

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RAW MATERIALS

Export Potential of Indian Spices

West Asia has emerged as the third largest region among the spice importing regions of the world. The markets in this region are free trading centres with no quantitative or quota restrictions on spices imports as most of these countries have classified spices under non-dutiable goods. However, quality is the prime concern of this market.

Among the individual countries in West Asia, UAE takes the lead with a share of 64 per cent followed by Saudi Arabia with 18 per cent. Iran, Jordan, Oman etc are the other important countries. In West Asia, spice consumption is mainly in cooking.

Kuwait

Kuwait imports about 4,000 tonnes of spices annually. Cardamom, ginger and spice mixtures are the major items. Kuwait is next to Saudi Arabia in the import of cardamom.

Kuwait is a free trading centre and as such local importers need not obtain any import license for each product they intend to import.

The only requirement is an annual import license from the ministry of commerce and industry. The import can be made by a letter of credit according to which payment is made after the completion of shipping formalities or through instalments or by credit sales.

Freshness and aroma, the most significant aspect of spice powders, are retained by packing

in air-vacuumed aluminium foils. It is reported that China has already introduced this type of packing.

Oman

Oman also is an important market for spice powders and mixtures. Garlic, pepper, cinnamon, clove, cardamom and seed spices are imported. Volume-wise, spice mixtures comprise the bulk, accounting for 57 per cent of the total import. During 1994, the total import of spice mixture was 2123 tonnes. UAE is the major source followed by India and Pakistan.

There is a customs duty of five per cent on the spice items imported to Oman.

The standardization Metrology-Organisation for GCC countries have brought out the standards for labelling of pre-packaged foods. This is applicable to Oman also. The packaged foodstuffs shall indicate its true nature and shall be confined to it.

Iran

Iran is a producer, exporter and importer of spices. Coriander, cumin and saffron are produced in Iran. They export these spices to other West Asian countries like Dubai and Kuwait. However, spices like turmeric and pepper are imported for its domestic consumption.

The annual production of coriander is around 15,000 to 20,000 tonnes, cumin 20,000 to 50,000 tonnes and saffron 100 to 120 tonnes. Meagre volumes of black cumin produced in the countries used for domestic consumption.

Turmeric is the most important item imported by Iran accounting for more than 80 per cent

of the total volume of imports. Pepper, ginger and cardamom are the other spices imported by Iran.

The import of ground spices into Iran is not encouraging. Usually importers and processors import spices in whole form or ground and pack it in consumer packs of 100 and 200 gms packets of polythene bags. Supermarkets are the major retail outlets for the spices.

For spices, generally 15 per cent customers tariff is imposed. The exceptions are five per cent on turmeric and cumin black and 20 per cent on saffron. In addition to the tariff, an additional 15 per cent commercial interest is collected for commodities imported in ready packages for retailers. For commodities imported in large packages, the commercial interest is only 10 per cent.

Jordan

Jordan imports around 3,000 tonnes of spices annually. Cardamom, seed spices and turmeric are the important items.

In Jordan, 80 gms packings are preferred for most of the spice powders including curry mixture. However, curry powder in 113 gms marketed by J.A. Sherwood & Co. Ltd., UK, is available. This is costlier than other brands and attracts a specific segment of the market.

Good port facilities in Aqaba and marketing facilities make Jordan an ideal centre for entre-port. They also have set up free zones where all types of duties are exempted for the first fifteen years.

Spices in whole form can be brought into this zone and can be processed and packed and can be re-exported to other Middle East and African countries.

UAE

UAE is the largest importer of spices in this region with an annual import of around 75,000 tonnes. However, their domestic consumption is much less as they re-export a major share to other countries like Iran and Saudi Arabia. Since there is no statistical data on re-exports, it is difficult to estimate the actual domestic consumption.

Almost all spices find way to UAE but the major ones are garlic, turmeric and seed spices like cumin and coriander. For seed spices, Iran is the major source, while for turmeric it is India.

Garlic is mainly imported from China. In Dubai, there are many spice grinding units, which import raw materials from India and other producing countries.

Grain Amaranth - The Wonder Crop

Amaranthus species yielding highly nutritious grains in addition to the tasty fresh leaves for the kitchen have always been popular among the tribal communities and poor peasants of South India.

The quick growing plants are heavy yielders of edible leaves and grains. The popular new world species of grain Amaranth varieties fall within the three promising species of *Amaranthus caudatus* (*Amaranthus edulis* is classified as a race of this species native to Peru and other Andean countries), *Amaranthus cruentus* and *Amaranthus hypochondriacus* (also known as *Amaranthus*

leucocarpus). These species produce large seedheads loaded with white or cream-coloured seeds that are nutritious foodgrains.

The stem, leaves and flowers of these broadleaved plants, one of the few non-grasses producing significant amounts of edible grains, are usually richly coloured - red, purple and gold.

Amaranth grains are a good source of high quality proteins. They contain unusual amounts of exceptionally nutritious proteins, and with as much as 16 per cent proteins, they are much more valuable than the conventional cereals. The quality proteins, with extraordinary amounts of lysine (an amino acid that is generally low in cereals) makes amaranth, a good complement to conventional cereals. *Amaranthus edulis* grain is rich in lysine (6.2 g per 100 g protein). However, the amaranth grains are deficient in the amino acid leucine.

The seeds have good amounts of starch, which can match the highly priced starch of waxy maize in quality. A blend of amaranth flour and wheat flour almost reached the perfect chemical score of 100 in meeting the theoretically balanced essential amino acid scale set by the nutritionists, who measure the protein quality. The amino acids deficient in wheat are abundant in amaranth grains. The grains are popped and they taste like a crunchy, nutty-flavoured popcorn. The light and crisp popped seeds are delicious as a snack, as a cold breakfast cereal with milk and honey. The grains are used for making confections with honey or syrup after popping the grains.

Pounded grains can be used in the preparation of invigorating drinks. Parched and milled grains

are used to make grainy, light coloured flour suitable for pancakes, biscuits, breads, cakes and a host of other baked foods. Amaranth flour without any gluten content need to be necessarily mixed with wheat flour to make the baked products rise.

Amaranth leaves are rich in proteins, vitamins and minerals. The tender leaves and stem of the grain and vegetable-type amaranth are cooked and eaten as greens. Known for their mild flavour, the leaves taste like spinach and artichoke. Normally, the amaranth grown for grain purpose is partly used for greens also. After a few rounds of clipping the tender leaves in the initial stage of growth, the crop is allowed to set seeds. A healthy stand of crop can yield up to 1 tonne of grains per hectare. The pale seeded types endowed with good appearance, fine flavour and excellent popping qualities are usually sought for grain purposes and the dark-seeded ones are reserved as greens and ornamental purposes.

A quick growing plant species, amaranths adopt themselves to a host of environments and grow vigorously even in adverse conditions. They are blessed with an efficient type of photosynthesis, the C-4 carbon-fixation pathway in scientific parlance, the amaranths can perform exceedingly well at high temperatures in bright sunlight and dry conditions. They are efficient harvesters of sunlight and need half the water used by conventional plants. Hence, the amaranths are ideal candidates to ensure food, nutritional and livelihood security for people inhabiting the marginal, hot and dry regions of the world.

DATA BANK

Foods Wasted Annually in USA (A study report by the Department of Agriculture, USA)

(in billions of Pounds)

Food item	Food supply	Food waste	% Wasted
Fats and oils	20.2	6.8	33
Grain products	45.6	14.6	32
Dairy products	76.3	24.4	32
Sweeteners	38.8	11.9	31
Eggs	7.9	2.5	31
Vegetables	63.1	15.9	25
Fruits	43.3	11.3	23
Meat, poultry and fish	51.4	8.2	16
Dry beans and lentils	2.3	0.4	16
Nuts	1.9	0.3	16
Total	355.9	96.3	27

India's Post-Blossom Coffee Crop Forecast for 1997-98 (in Tonnes)

Region/State	Arabica	Robusta	Total
Karnataka	86,200	81,800	1,68,000
Kerala	3,000	45,000	48,000
Tamil Nadu	13,000	10,000	23,000
N.E. Region & Non-Traditional Areas	2,000		2,000
Total for India	1,04,200	1,36,800	2,41,000

Source : Coffee Board

TRADE FAIRS & GET-TOGETHERS

Asia's Biggest Food Event "Food & Hotel Asia '98"

The 4th International Exhibition for Wine, Spirits and Beers for the Asian Region will be held at the World Trade Centre and Singapore Suntec Centre, Singapore from 14-17 April 1998. The exhibition has the official support of all the leading food and hospitality associations of Singapore as well as those of Indonesia, Malaysia, Thailand and Hongkong.

Further details are available from :

Matthew Meredith,
Overseas Exhibition Services Ltd
11, Manchester Square
London, W1M 5AB
Tel : +44171 4861951
Fax : +44171 4138210
E-mail : oesfood @ montnet.com.

Anuga

The leading event for the World Market in Food will be held from 11th October 1997 at the Cologne exhibition centre, Cologne, Germany. Anuga is the leading event for the following categories.

- * General provisions and stable foods, health foods, canned foods and spices.
- * Meat and sausage and poultry
- * Fish, shellfish and seafoods

- * Frozen foods and ice-cream products
- * Milk and dairy products
- * Bread, bakery products, spreads and hot beverages
- * Drinks
- * Fresh fruits and vegetables
- * Catering and take-home trade technology
- * Trade forum.

For further information, contact :

Koln Messe,
Messeplatz,
D-50679, Cologne
Postfach 210760
D -56532, Cologne
Tel : 0-221/821-0
Fax : 0-221/821-2574
India :
Indo-German Chamber of
Commerce
Maker Tower 'E' 1st Floor
Cuffe Parade,
Mumbai - 400 005
Tel : +91-22 2186131
Fax : +91-22 2180523.

Industry- Scientist Meet at Hisar (September 19- 20, 1997)

The Association of Food Scientists and Technologists (Hisar Chapter) and the Department of Foods and Nutrition, CCSHAU are organizing an Industry-Scientist Meet on "Latest advances on

quality control of bakery products" during September 19-20, 1997 at College of Home Science, Hisar.

The objectives of the meet are

i) to take stock of the latest regulations pertaining to bakery products for internal consumption and export market.

ii) to provide a forum for exchange of ideas and discuss on quality aspects of bakery products.

iii) to invite suggestions for implementation and modifications of standards and regulations for practical application in the field of bakery units.

Apart from the members of the local chapter and other chapters of the Association, experts from the Food Science and Technology Disciplines and personnel associated with Food Ministry, Department of Industry, Haryana Government, ICAR are expected to participate.

For further information contact :

Dr P. C. Panda,
President-cum-Chairman,
Department of Animal Products
Technology
CCSHAU, Hisar - 125 004.
Tel : (o) 01662-31171-73 Ext 4415
Fax : 01662-34952

or

Dr (Mrs) Salil Sehgal
Convenor-cum-Professor and
Head, Department of Foods &
Nutrition
College of Home Science,
CCSHAU, Hisar - 125 004.
Tel : (o) 01662-31171-73 Ext 4243
Fax : 01662-34952.

"Dairy India - 1997" (5th Edition)

Editor P.R. Gupta . Published
by Gupta and Associates A-25
Priyadarshini Vihar,
Delhi - 110 092, pp 1-904 + (i-xv)
ISBN. No. 970-90322

This professional compendium is the 5th popular edition of Dairy India - 97. It is a comprehensive authoritative Reference Work which is the result of the excellent efforts of the Editor-cum-Publisher in yoking the cooperation of as many as 60 experts drawn from diverse disciplines of Dairy Science and Technology, such as breeding, milk-production & processing technology, dairy engineering/technology, traditional dairy products technology, health care, feeds and nutrition. The very fact that this is the 5th edition, proves beyond a shadow of doubt its popularity as well as technological utility, as it highlights the latest important advances made in R&D in Dairy Science and Technology as a result of which India has only recently attained a coveted place of eminence in the world scenario in milk production to the tune of over 67 million tonnes, being next only to the USA producing about 70.8 million tonnes! The top five world milk producing countries are (1) USA (2) India (3) Russia (4) Germany and (5) France. The top 10 Indian States producing milk in the descending order are : (1) Uttar Pradesh : 10 million tonnes, (2) Punjab : 6.3 MT, (3) Madhya Pradesh : 6.0 MT; (4) Rajasthan : 5.5 MT; (5) Tamil Nadu: 4.2 MT; (6) Gujarat : 4.1 MT; (7) Andhra Pradesh : 4.0 MT; (8) Bihar : 3.8;

Maharashtra : 3.8 MT; (10) Haryana : 3.8 MT India alone contributes about 16.0% to the world pool, but still the Indian per capita milk consumption is estimated to be now about 200 g (1995-96) as compared to the NIN (National Institute of Nutrition, Hyderabad) recommended minimum milk requirement of 220 g. Thus, this useful publication is a very good store-house of wealth of technological information. For the convenience of its broad spectrum of readership, this book has been divided into 5 sections as follows:-

Section 1 is a General one, covering about 30 papers on milk production, productivity, cooperatives, marketing, Asian and Indian Dairy Scenario, Women in dairying, important factors governing profitable dairying, recent trends in World Dairying, SAARC, GATT, WTO, Export operation flood and statistics, etc., Specialist papers by Dr. V. Kurien, the father of Cooperative Dairying in India and other well-known dairy experts like Dr. R.P. Aneja, Dr. B.P.S. Puri, etc. add to the value of this publication.

Section 2 is on Management and covers all diverse aspects like (a) Management Guide (5 papers); (b) Milk and Milk Products (7); (c) Breeding (2); (d) Feeding and Nutrition (3); (e) Health Care (3); (f) Dairy Technology; (g) - Invited papers (9) and (h) Traditional Dairy Products (2);

Section 3 is on Research and Reference works (350 literature references); Quality Standards, PFA Rules and Glossary. **Section 4** comprises an excellent Directory covering useful information and addresses of Analytical Laboratories; Dairy Associations, Dairy Consultants, Dairy Consumables, Dairy Cooperatives,

Dairy Farms, and Dairy Processing Plants, etc. The last **Section 5** covers : "Who is Who". The most important sub-sections of interest to the members of AIFPA are on : (i) Dairy Technology; (ii) Milk and Milk Products Technology; (iii) Traditional Milk Products Know-how; (iv) Research and Reference Section covering "Technology Bank" at NDRI, etc.

In a nutshell, this is an excellent, authoritative compendium, painstakingly prepared and could serve as "Bible" in Dairy Science and Technology in India. This comprehensive publication contains 229 tables, 38 coloured and B&W illustrations and about 350 categorized bibliographical references, which should prove to be of great practical value to all the industrialists, entrepreneurs, research scholars, teachers, and students alike. Besides, the quality of paper, printing and hard binding are superb. Thus, this book should find a respectable place on the shelves of all the libraries of Agricultural Universities in India and abroad, as well as all libraries attached to Dairy Science Colleges, Dairy/Agri/Animal husbandry Departments, R&D Centres all over India.

J. S. Pruthi
UNDP Advisor & Ex Director,
AGMARK, Govt. of India

"CSIR Rural Technologies" A Compendium - 1995

Published by the Council of Scientific and Industrial Research (CSIR), Publications and Information Directorate, Dr. K. S. Krishnan Marg, New Delhi - 110 012, pp 1-164 (A-4), First Edition, Profusely illustrated with Coloured and B&W Photos, etc.

Of recent, greater emphasis is being laid on the Economic Uplift and Development of the Rural Sector in India through the systematic input of newer Science and Technology. Over 40 National Laboratories/R&D Institutes under the aegis of the CSIR (Council of Scientific and Industrial Research, New Delhi), located throughout the length and breadth of the country, are generating new, simple and appropriate innovations/technologies over a wide spectrum of industrial R&D endeavour. Quite a number of these newer technologies have a special significance for the Rural Sector, which also has a notable component of rural employment. Thus, Rural Industrialisation will not only help in much needed employment generation both in the farm and non-farm sub-sectors, but also through the **Value Addition** and better utilization of rural resources and help in the economic development of the rural sector at large.

With the noble object of dissemination of the useful technological information thus generated through the Appropriate Technologies developed so far (upto 1995), the CSIR has published this unique semi-technical compendium covering as many as 350 appropriate technologies developed by the various National Laboratories/Institutes of the

CSIR, which have been documented systematically under 9 sections, viz., (i) Food and agro-based industries; (ii) Cultivation and processing of economic plants; (iii) Animal-based technologies; (iv) Building materials, components and systems; (v) Rural road development; (vi) Drinking water : its exploration, purification, quality assessment and storage techniques; (vii) Environment and sanitation; (viii) Upgradation of artisanal skills and (ix) Other technologies.

This compendium has been painstakingly compiled by Shri A. K. Bhatia, Joint Advisor, CSIR and associates.

The CSIR has been covered categorywise : (a) 34 Select technologies for fruit and vegetable processing and new product development; (b) 23 Technologies for processing of cereals, pulses, millets etc., (c) 14 Spice-based technologies; (d) 18 under meat, poultry, eggs, fish, crustaceans, etc., (e) 13 for oilseed processing; (f) 4 on food flavour and colour improvers, (g) 51 under aromatic, medicinal and economic plants, etc. Besides, there are (h) 22 on drinking water purification and quality assessment, (i) 11 under environment and sanitation, including industrial-waste water disposal and other industrial waste utilization. In addition, there are numerous other technologies relating to non-food sector, (not covered here in this review).

The CSIR and its Publications and Information Directorate deserve praise for bringing out this useful technological compendium, which is a storehouse of 350 newer appropriate technologies, indicating ample scope for rural industrialization and economic development of agro-food and other farm and non-farm industries in the Rural Sector throughout the country, based on the technological know-how generated by the various CSIR National Laboratories / Institutes,

notably the CFTRI, Mysore, RRLs at Jammu, Jorhat and Thiruvananthapuram, CIMAP, MERADO, NEERI, etc. All the 41 National Laboratories, their Regional Centres and 7 Polytechnology Transfer Centres of the CSIR have been listed with full addresses at the end of the book. The CSIR and the concerned laboratories would be happy; (a) to provide any additional information on technological know-how to the potential users; (b) to provide turn-key consultancy services therefor; (c) to receive any feed-back from the actual potential users and to take appropriate actions thereon and (d) to receive or hear any more R&D needs for the rural industrialization in the country.

The production, the presentation, the quality of paper, the printing and binding of this compendium are of high order. On the whole, it contains 'wealth of useful technological information', colourful illustrations, flow-diagrams etc. for the broad guidance of the prospective Rural Entrepreneurs and the industrialists alike. Definitely, this compendium should find a place on the shelves of libraries of all the Agricultural Universities, State Departments of Food, Agriculture, Horticulture and Industries and all the concerned commercial establishments in India.

J. S. Pruthi

Food Safety

Authors - Ramesh V. Bhat and R. Nageswara Rao, National Institute of Nutrition, Indian Council of Medical Research, Hyderabad. Publishers : The Bangalore Printing and Publishing Co Ltd, Mysore Road, Bangalore - 560 018, India. pp 156 + viii, price Rs. 69/-

The books aims to provide an insight into various aspects of food safety/hygiene. Food service industry has an important role to

play in maintaining food quality and food safety. During recent years, more and more people are eating out in cosy restaurants, office canteens or even in streets. Fast foods are becoming popular in this context. Therefore, there is a need for a change from the traditional customs to suit the new environment.

There is a dearth of trained technical personnel in the hotel industry. Many catering Institution offer 3 year diploma/degree courses. But the staff and students of these institution are handicapped for lack of standard text books. In this context, this book will serve as an information source for the prac-

tising personnel in hotels, institutions and other catering places.

Easy Reference Customs Tariff 1997-98 + Weekly Index of Changes (13th edition)

Editor - Arun Goyal ; Publishers " Academy of Business Studies. Price Rs. 530/-

This is an essential handbook for importers and exporters.

It is the only book, which gives the countervailing duty. Academy of Business Studies (ABS) are the leaders in the field of import, export and foreign exchange information since 1983. ABS are also publishing the fortnightly magazine "World Trade Scanner" in collaboration with MVIRDC World Trade centre, Mumbai.

Address enquiries to :

Academy of Business Studies,
24/4866, Sheeltara House,
Ansari Road,
New Delhi - 110 002

Tel : 91-11-3281314, 3263470,
3263570

Fax : 91-11-3252880.

AWARDS

Jawaharlal Nehru Award - 1996

Dr. JHARI SAHOO, Associate Professor (Meat Technology), Department of Animal Products Technology, CSS Haryana Agricultural University, Hisar, was honoured with the prestigious Jawaharlal Nehru Award - 1996 instituted by ICAR and this was presented to him by Shri Chaturanan Mishra, President, ICAR Society and Union Agriculture Minister during the ICAR Awards Ceremony held on July 16,

1997 at PHD House Auditorium, Khel Gaon Road, New Delhi. He was conferred with this award for his outstanding Post-graduate Agricultural Research in the field of Livestock Product Technology. The award carried a medal, certificate, citation and a cash prize of Rs. 10,000/-

Dr. Sahoo conducted his research work under the guidance of Dr. A.S.R. Anjaneyulu, Senior Scientist, Division of Livestock Product Technology, Indian Veterinary Research Institute, Izatnagar.

Dr. Sahoo explored the optimum level of two natural antioxidants viz., sodium ascorbate

and alpha-tocopherol acetate for preblending them with Ground Buffalo Meat (GBM) to minimize its pigment and lipid oxidation, thus enhancing the colour and flavour stability of meat during refrigerated and frozen storage. The keeping quality of preblended GBM was further increased by application of vacuum packaging. His studies are not only very useful to boost the export of meat and meat products from our country, but also beneficial for meat consumers to combat the health hazards like cancer, cardiovascular diseases and cataract.

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Book Reviews

AFST(I) NEWS

Mumbai Chapter

The following were elected to the Local Executive Committee of AFST(I), Mumbai Chapter for the year 1997-98.

President :

Dr. A. S. Gholap

Vice President (s) :

Prof. (Ms.) P. R. Kulkarni

Dr. S.B.K. Warriar

Hon. Secretary :

Dr. Arun Behere

Hon. Jt. Secretary :

Dr. S. V. Bhalkar

Hon. Treasurer :

Mr. N. D. Kamat

Members :

Dr. M. D. Alur

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Dr. S.D. Kolhe

Dr. R.Y. Mantri

Dr. (Ms.) V.S. Rao

Dr. J.A. Sakhavalkar

Mr. Suresh Sathe

Dr. (Ms.) R. Singhal

Notice for the Annual General Body Meeting (AGBM)

This is in continuation of the earlier circular dated 1/7/1997 sent out to our members regarding AGBM and election for the year 1997-98, it may be noted that the Annual General Body Meeting of the Association will be held at Multipurpose Hall of BARC Training School Hostel in Mumbai on Friday, the 26th September 1997 at 5.30 pm.

M.S. Krishnaprakash

Hony. Exec. Secretary

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To The Chief Editor, *Indian Food Industry*
AFST(I), CFTRI Campus, Mysore - 570 013

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